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NATIONAL DAM SAFETY PROGRAM. WINDMILLER DAM NUMBER 1 (MO 10035)--ETC(U)
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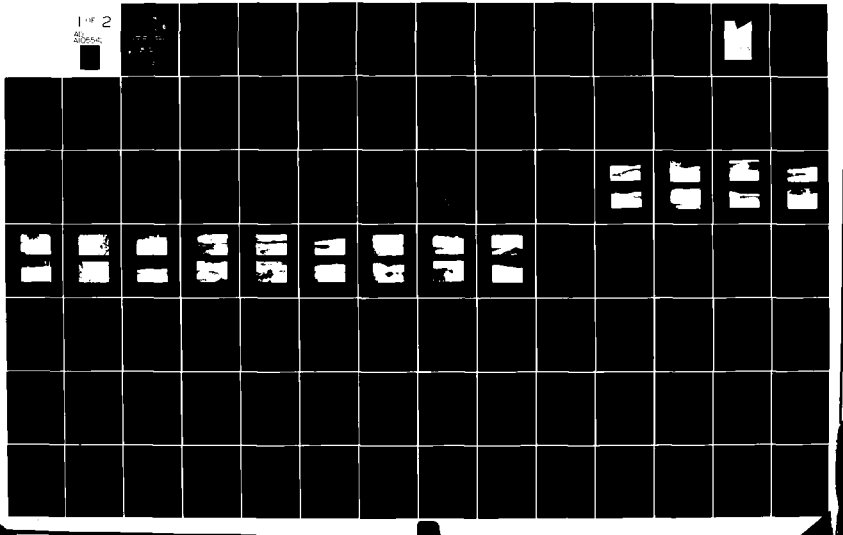

MISSOURI - KANSAS CITY BASIN

AD A105542

LEVEL II

WINDMILLER DAMS

BOONE COUNTY, MISSOURI

MO. 10035

MO. 11675

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

United States Army
Corps of Engineers
...Serving the Army
...Serving the Nation

St. Louis District

PREPARED BY: U.S. ARMY ENGINEER DISTRICT, ST. LOUIS

FOR: STATE OF MISSOURI

MAY, 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report was prepared under the National Program of Inspection of Non-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

WINDMILLER DAM NO. 1 - MO. 10035

WINDMILLER DAM NO. 2 - MO. 11675

BOONE COUNTY, MISSOURI

PHASE I INSPECTION REPORT

(6) NATIONAL DAM SAFETY PROGRAM.

Windmiller Dam Number 1 (MO 10035),
Windmiller Dam Number 2 (MO 11675),
Missouri - Kansas City Basin,
Boone County, Missouri. Phase I Inspection Report.

PREPARED BY
HOSKINS-WESTERN-SONDEREGGER, INC.
CONSULTING ENGINEERS
LINCOLN, NEBRASKA

UNDER DIRECTION OF

ST. LOUIS DISTRICT, CORPS OF ENGINEERS

FOR

GOVERNOR OF MISSOURI

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(9) Final rept.,

(15) DACW43-79-C-0046

(10) Rey S. /Decker
Gordon G. /Jamison Michael /McMeekin
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394131

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 NORTH 12TH STREET
ST. LOUIS, MISSOURI 63101

REPLY TO ATTENTION OF

LMSED-P

SUBJECT: Phase I Inspection Report

This report presents the results of field inspection and evaluations of the Windmiller Dam No. 1 and Windmiller Dam No. 2.

It was prepared under the National Program of Inspection of Non-Federal Dams.

Dam No. 2 has been classified as unsafe, emergency by the St. Louis District as a result of the following criteria:

a. Spillway of Windmiller Dam No. 2 will not pass a 10-year frequency flood without prolonged overtopping of the dam. The spillway is, therefore, considered to be unusually small and seriously inadequate

b. Prolonged overtopping of Windmiller Dam No. 2 could result in failure of both dams.

c. Dam failure significantly increases the hazard to life and property downstream.

Dam No. 1 is classified as unsafe, non-emergency by the St. Louis District as a result of the following criteria:

a. The spillway will not pass 50 percent of the Probable Maximum Flood without overtopping the dam.

b. Overtopping could result in failure of Dam No. 1.

c. Failure of Dam No. 1 significantly increases the hazard to life and property downstream.

SUBMITTED BY: SIGNED — 17 APR 1980
Chief, Engineering Division — Date

APPROVED BY: SIGNED — 17 APR 1980
Colonel, CE, District Engineer — Date

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
ASSESSMENT SUMMARY

Name of Dam	Windmiller Dam No. 1 - MO 10035
State Located	Missouri
County Located	Boone County
Stream	McClure Creek
Date of Inspection	May 31, 1979

Windmiller Dam No. 1 was inspected by an interdisciplinary team of engineers from Hoskins-Western-Sonderegger, Inc. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.

The guidelines used in the assessment were furnished by the Department of the Army, Office of the Chief of Engineers, and developed with the help of several Federal and State agencies, professional engineering organizations, and private engineers. Based on these guidelines, this dam is classified as a small size dam with a high downstream hazard potential. Failure would threaten life and property. The estimated damage zone extends approximately two miles downstream of the dam. Within the damage zone are one dwelling, several outbuildings, two powerlines and a Highway V bridge.

Our inspection and evaluation indicates that the spillway does not meet the criteria set forth in the recommended guidelines for a small dam having a high hazard potential. Considering the small volume of water impounded and the large floodplain of Cedar Creek downstream from the dam, one-half of the Probable Maximum Flood is the appropriate spillway design flood. The spillway will not pass the 100-year flood (flood having a one percent chance of being exceeded in any year) without overtopping the dam. The spillway will pass 10% of the Probable Maximum Flood and the 10-year flood without overtopping the dam. The Probable Maximum Flood (PMF) is defined as the flood that may be expected from the most severe combination of critical meterologic and hydrologic conditions that are reasonably possible in the region.

No design data were available for this dam. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency. These analyses should be obtained in the future.

Recommendations made in Section 7 of the report relative to minimizing or eliminating the potential for overtopping of this dam should be pursued on an immediate basis.

Maintenance items recommended in the report are directed toward tree removal, beaver control, periodic monitoring of seepage and flow from a spring, and repair of minor erosion along the upstream face.

Rey S. Decker
E-3703

Gordon Jamison

Michael McMeekin
E-4776

H. P. Hoskins
Harold P. Hoskins
Chairman of Board
Hoskins-Western-Sonderegger, Inc.
E-8696

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
ASSESSMENT SUMMARY

Name of Dam	Windmiller Dam No. 2 - MO 11675
State Located	Missouri
County Located	Boone County
Stream	Tributary to McClure Creek
Date of Inspection	May 31, 1979

Windmiller Dam No. 2 was inspected by an interdisciplinary team of engineers from Hoskins-Western-Sonderegger, Inc. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.

The guidelines used in the assessment were furnished by the Department of the Army, Office of the Chief of Engineers, and developed with the help of several Federal and State agencies, professional engineering organizations, and private engineers. Based on these guidelines, this dam is classified as a small size dam with a high downstream hazard potential. Failure would threaten life and property. The estimated damage zone extends approximately two miles downstream of the dam. Within the damage zone are one dwelling, several outbuildings, two powerlines and a Highway V bridge.

Our inspection and evaluation indicates that the spillway does not meet the criteria set forth in the recommended guidelines for a small dam having a high hazard potential. Considering the small volume of water impounded and the large floodplain of Cedar Creek downstream from the dam, one-half of the Probable Maximum Flood is the appropriate spillway design flood. The spillway will not pass the 100-year flood (flood having a one percent chance of being exceeded in any year) without overtopping the dam. The spillway will pass 5% of the Probable Maximum Flood but will not pass the 10-year flood without overtopping the dam. The Probable Maximum Flood (PMF) is defined as the flood that may be expected from the most severe combination of critical meterologic and hydrologic conditions that are reasonably possible in the region.

No design data were available for this dam. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency. These analyses should be obtained in the future.

Recommendations made in Section 7 of the report relative to minimizing or eliminating the potential for overtopping of this dam should be pursued on an immediate basis.

Maintenance of this dam is generally good.

Rey S. Decker
E-3703

Gordon Jamison

Michael McMeekin
E-4776

H. P. Hoskins
Harold P. Hoskins
Chairman of Board
Hoskins-Western-Sonderegger, Inc.
E-8696

PHOTO NO. 1 - OVERVIEW - DAM NO. 1 IN CENTER. DAM NO. 2 IN UPPER CENTER.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
WINDMILLER DAM NO. 1 - MO. 10035
WINDMILLER DAM NO. 2 - MO. 11675
BOONE COUNTY, MISSOURI

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority. The National Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of safety inspection of dams throughout the United States. Pursuant to the above, the St. Louis District, Corps of Engineers, District Engineer directed that a safety inspection of Windmiller Dam No. 1 and Windmiller Dam No. 2 be made.

b. Purpose of Inspection. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.

c. Evaluation Criteria. Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams", Appendix D to "Report of the Chief of Engineers on the National Program of Inspection of Dams," dated May, 1975, and published by the Department of the Army, Office of the Chief of Engineers.

1.2 DESCRIPTION OF PROJECT

a. Description of Dams and Appurtenances.

(1) The project consists of two earth dams and impoundments separated by an earthen dike. The project originally functioned as one dam with two reservoirs interconnected through an excavated channel. Mrs. Elizabeth Windmiller, the owner, reported that the channel was closed by construction of a dike in 1978.

MO 10035 is the larger of the two dams and is referred to throughout this report as Dam No. 1. MO 11675 is referred to as Dam No. 2.

(a) Dam No. 1 is the larger of the two dams and impounds flow in McClure Creek. It is approximately 980 feet in length and 30 feet in height. McClure Creek enters Cedar Creek approximately 1000 feet downstream from Dam No. 1.

(b) Dam No. 2 extends southwesterly about 600 feet from the northwest end of Dam No. 1 and is about 20 feet in height. This dam impounds flow in a tributary to McClure Creek.

(2) Spillways

(a) Dam No. 1 - The only spillway for this dam consists of a channel excavated through limestone bedrock in a swag in the left abutment about 1300 feet upstream from the left end of the dam. (See Plate A-1 and the Aerial Overview Photo.)

(b) Dam No. 2 - The only spillway for this dam consists of a channel excavated through earth on the right (southwest) abutment.

(3) Pertinent physical data for both dams are given in paragraph 1.3 below.

b. Location. The dams are located in the southeast portion of Boone County, Missouri, as shown on Plate A-2. Dam No. 1 is shown on Plate A-1 in the NE¼ of Section 9, T46N, R11W. Dam No. 2 is shown in the NW¼ of the same section.

c. Size Classification. Criteria for determining the size classification of dams and impoundments are presented in the guidelines referenced in paragraph 1.1c above. Based on these criteria, these dams and impoundments are in the small size category.

d. Hazard Classification. Guidelines for determining hazard classification are presented in the same guidelines as referenced in paragraph 1.1c above. Based on referenced guidelines, these dams are in the High Hazard Classification. The estimated damage zone extends approximately two miles downstream from the dams. Within the damage zones are one dwelling, several outbuildings, two powerlines, and a Highway V bridge.

e. Ownership. The dams are owned by Elizabeth Windmiller, Rt. 1, Ashland, MO. 65010.

f. Purpose of Dams. The dams impound recreational reservoirs.

g. Design and Construction History. A single continuous dam was constructed in 1962 to impound waters from McClure Creek and from a tributary to McClure Creek. The dam formed two interconnected reservoirs until 1978. Mrs. Elizabeth Windmiller, the owner, reported that a divider dike was constructed in 1978 which closed the channel between the two drainageways. The work done in 1978 also included the construction of an earthen spillway through the right abutment of the portion of the dam which impounded the water from the tributary to McClure Creek. The effect of the 1978 construction work was to convert the original dam into two separate dams each of which impounds water from its own drainageway.

h. Normal Operating Procedure. There are no operating facilities for either of the dams.

1.3 PERTINENT DATA

a. Drainage Area.

(1) Dam No. 1 - 1.33 sq. mi. (851 acres)
(2) Dam No. 2 - 0.24 sq. mi. (154 acres)

b. Discharge at Damsite.

(1) All discharges at the damsites are as follows:

(a) Dam No. 1 discharge is through a channel excavated through limestone bedrock approximately 1300 feet north of the left end of the dam. See Plate A-1.
(b) Dam No. 2 discharge is through a channel excavated through earth on the right abutment.

(2) The estimated maximum flood is unknown for either dam.

(3) Spillway Capacity.

(a) Dam No. 1 spillway capacity varies from 0 c.f.s. at elevation 625.0 (Min. crest elev.) to 540 c.f.s. at elevation 627.4 (min. top of dam).

(b) Dam No. 2 spillway capacity varies from 0 c.f.s. at its crest elevation of 627.7 to 5 c.f.s. at elevation 627.9 (min. top of dam).

c. Elevations. (Feet above M.S.L.)

(1) Top of dam (minimum)

(a) Dam No. 1 - 627.4
(b) Dam No. 2 - 627.9

(2) Spillway Crest

(a) Dam No. 1 - 625.0
(b) Dam No. 2 - 627.7

(3) Streambed at centerline

(a) Dam No. 1 - 598±
(b) Dam No. 2 - 608±

(4) Maximum Tailwater - Unknown for either dam.

d. Reservoir. Length (feet) of maximum pool.

(1) Dam No. 1 - 2300±
(2) Dam No. 2 - 800±

e. Storage (Acre-feet).

(1) Top of Dam

(a) Dam No. 1 - 330±
(b) Dam No. 2 - 70±

(2) Spillway Crest

(a) Dam No. 1 - 260±
(b) Dam No. 2 - 70±

f. Reservoir Surfaces (Acres).

(1) Top of Dam

(a) Dam No. 1 - 27±
(b) Dam No. 2 - 5±

(2) Spillway Crest

(a) Dam No. 1 - 23±
(b) Dam No. 2 - 5±

g. Dam.

(1) Type - earth fill (both dams)
(2) Length
(a) Dam No. 1 - 980 ft. ±
(b) Dam No. 2 - 600 ft. ±
(3) Height
(a) Dam No. 1 - 30 ft. ±
(b) Dam No. 2 - 20 ft. ±
(4) Top Width
(a) Dam No. 1 - 15 ft. ±
(b) Dam No. 2 - 14 ft. ±
(5) Side Slopes
(a) Downstream - Dam No. 1 - 1.9H on 1V (See Plate C-2)
Dam No. 2 - 3.2H on 1V
(b) Upstream - Dam No. 1 - 2.8H on 1V
Dam No. 2 - 1H on 1V(exposed)
(6) Zoning - Unknown for both dams.
(7) Impervious core - unknown for both dams.
(8) Cutoff - Unknown for both dams.
(9) Grout Curtain - Unknown for both dams.
(10) Wave Protection
(a) Dam No. 1 - Riprap
(b) Dam No. 2 - Poor vegetation
(11) Internal Drainage System - Unknown for both dams.

h. Diversion Channel and Regulating Tunnel. None for both dams.

i. Spillway.

(1) Dam No. 1
(a) Type - uncontrolled, excavated channel in limestone bedrock, approximately 1300 feet upstream from dam on left abutment.
(b) Control section - concrete paved roadway, 44 feet long and 12 feet wide. (See Photos 16, 18, 19 and Plate C-3).

(c) Crest elevation - 625.0 feet±
(d) Upstream Channel - excavated earth - rock
(e) Downstream channel - excavated rock on approximate 12.5% slope.
(f) Low flow outlet - 12-inch CMP located under concrete roadway control section.

(2) Dam No. 2
(a) Type - uncontrolled earth channel on right abutment.
(b) Control section - earthen weir section 5 feet wide with side slopes of approximately 10H on 1V.
(c) Crest elevation - 627.7 feet±
(d) Upstream Channel - nearly level approach channel.
(e) Downstream Channel - excavated earth on slope of 7%±

j. Regulating Outlets. None

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

No design data were available for these dams.

2.2 CONSTRUCTION

No construction data were available. It was reported by Mrs. Elizabeth Windmiller, that the dams were constructed in 1962 to form one interconnected reservoir. The channel connecting the reservoir was closed in 1978, and the spillway on the right end of the small dam was constructed.

2.3 OPERATION

No data were available on spillway operation.

2.4 EVALUATION

a. Availability. No data were available.

b. Adequacy. The field surveys and visual observations presented herein are considered adequate to support the conclusions of this report. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency. These seepage and stability analyses should be performed for appropriate loading conditions (including earthquake loads) and made a matter of record.

c. Validity. Not applicable.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General. A visual inspection of the Windmiller Dams was made on May 31, 1979. Engineers from Hoskins-Western-Sonderegger, Inc., Lincoln, Nebraska making the inspection were: R.S. Decker, Geotechnical; Gordon Jamison, Hydrology; Michael McMeekin; Civil Engineer. Mrs. Windmiller met the team at the dams but did not accompany the crew on the inspection.

b. Dams.

1) Geology & Soils (abutment and embankment). Soils in the area consist of clay and clay loam (CL-CH) developed on glacial till and/or residuum over limestone of lower Mississippian or Upper Devonian age. Limestone is not evident on the abutments of the dam but is exposed in the spillway upstream from the left end of Dam.No. 1.

Soils exposed near the north end of the divider dike appear to be glacial till (CH-CH). Materials exposed in the right abutment of Dam No. 2 appear to be residuum from limestone (CH).

Borings in both dams indicate CL-CH materials to a depth of 2 to 3 feet.

2) Upstream Slope.

a) Dam No. 1. The left half of the dam is plated with durable limestone riprap ranging up to 30-inches in maximum size. The riprap appears to be well graded, and there is very little erosion of the upstream face. The portion of the dam from Station 5+00± to the right end has some riprap but not sufficient to prevent some erosion of the upstream face as shown in Photo No. 6. The high water mark is about 2.5 feet above present lake level, and some erosion was noted at this elevation, particularly toward the right end of the dam. A few small trees and shrubs are growing on the face. No cracks, slumps, rodent holes or abnormal deformations were noted on the upstream face.

b) Dam No. 2. The small area of freeboard exposed (about 1-1.5 feet in elevation) is fairly well vegetated with water-loving grass and sedges.

There does not appear to be any riprap on the upstream slope. Very little erosion was observed on the face. No cracks, slides, rodent holes, or deformations were noted.

3) Crest.

a) Dam No. 1. The crest is well vegetated with adapted grasses and had been recently mowed. The profile of the crest is fairly uniform with about one-half foot variance in elevation between the center section and the abutments. No significant cracks (few drying cracks), deformations or rodent holes were observed on the crest.

b) Dam No. 2. The crest is fairly well vegetated with adapted grasses. Vegetation is sparse in an area near the left end of the dam (station 12 + 05 to 12 + 30±) (see photo 22). This area appeared to have been recently repaired for some unknown reason. No slips, cracks or rodent holes were observed on the crest.

4) Downstream Slope.

a) Dam No. 1. The downstream slope is well vegetated with adapted grasses and legumes. Several very large willow trees are growing on the slope and along the toe. No slides, slumps, abnormal deformations or rodent holes were observed on the slope. A great many cattails are growing along the toe of the dam between stations 2 + 50± and 6 + 50±. Seepage outcrops in both abutment troughs, somewhat higher in the right side (elev. 620±) than the left side (elev. 615±). No boils were observed and all seepage was clear. There is no visible flow from these seep areas, but water is ponded over most of the area.

A large seep or spring emerges from a hole about 12 inches in diameter located downstream from station 3 + 00+ about 20 feet downstream from the toe of the dam. An auger inserted into the hole encountered gravel and cobble at a depth of 3.5 feet which may be the original streambed material. Photo 12 was taken downstream from the spring and shows the discharge from the spring and surrounding area. Photo 13 shows the rod in the outlet. The discharge was all clear with iron stains as shown in Photo 12. The dark color of the discharge in Photo 13 results from boring in the channel and outlet hole. Total seepage discharge was estimated at 2 to 3 gal./min.

b) Dam No. 2. The downstream slope is very well vegetated with adapted grasses and legumes. No cracks, rodent holes or abnormal deformations were observed on the slope. There was no indication of any seepage on the slope or along the toe of the dam. Borings along the toe showed moist CL material to a depth of 3 feet.

5) Miscellaneous. Overtopping of Dam No. 2 would be most pronounced near the juncture of the left end of Dam No. 2 and the right end of Dam No. 1 (See Plate C-1). Prolonged overtopping (12 hours by a ten-year storm) causing erosion of the structure could encroach on the toe of Dam No. 1 with possible failure of both dams.

c. Appurtenant Structures.

1) Spillway.

a) Dam No. 1. The uncontrolled spillway for this dam is cut into thin to moderately thick-bedded limestones and limey shales, through a narrow swag or saddle in the ridge forming the left abutment about 1300 feet upstream from the dam. The access road to the dam crosses the spillway with a concrete slab 12 feet wide and 44 feet long, which forms a control section for the spillway. A 12-inch corrugated metal pipe culvert passes under the slab to handle low flows. Beavers have constructed a dam across the channel leading to the 12-inch CMP culvert as shown in Photo No. 18. The dam decreases the effectiveness of the culvert and increases the storage capacity of the reservoir by an estimated one foot in depth over what it would be if the channel were open. Mrs. Windmiller stated that the beavers keep plugging up the 12-inch pipe. Evidence of undercutting of the concrete slab is shown in Photo No. 18. The degree of undercutting could not be determined. The concrete slab roadway did not show signs of distress at the time of inspection. The limestone in the bottom of the spillway is massive and sound. The spillway outlets over a vertical limestone cliff into Cedar Creek. The road crossing the spillway is a private road serving as access to the owner's home.

b) Dam No. 2. The uncontrolled spillway for this dam is cut through CL-CH residual soils on the right end of the dam. The channel had been plated with about 6 inches of crushed limestone ranging in size up to 3 or 4 inches. Much of the crushed limestone had been displaced or carried away by water flowing

through the spillway, and the channel is eroding into the abutment soils. The elevation of the control section of the spillway is only 0.2 feet lower than the lower portion of the dam as shown on Plate C-1. It would appear that the spillway has carried significant flow at least once and possibly more times since its construction approximately one year prior to inspection. The water level in the lake must have approached the elevation of the low portion of the dam and may have overtopped which could account for the repair section shown in Photo No. 22. The approach channel to the spillway is open. Discharge from the spillway will flow away from the right abutment trough as shown in Photo No. 1--Overview.

2) Divider Dike. The dike between the two reservoirs is about 100 feet in length with crest elevation about 1 to 1.5 feet higher than the adjacent dams. The crest is well vegetated and is 12 feet in width. The main reservoir side is riprapped. The other side is not.

3) Drawdown facilities. There are no drawdown facilities for either of these impoundments.

d. Reservoir Area. No significant erosion was evident around the shore lines of these reservoirs. No slides nor slumps were observed.

e. Downstream Channel.

1) Dam No. 1. The downstream channel of the spillway is Cedar Creek which is open and cut into limestone.

2) Dam No. 2. The channel downstream from the spillway is overgrown with trees and brush, but this condition should not affect the operation of the spillway.

3.2 EVALUATION

a. Dam No. 1. The most serious potential of failure of this dam is the possibility of erosion of the toe at the juncture with Dam No. 2 due to prolonged overtopping of Dam No. 2. The seepage along the toe, including the large spring, does not appear to be critical but should be monitored periodically. Materials in the dam should provide adequate safety against shear failures for a dam with this height and side slopes. Additional studies would be required to determine the effects of overtopping on the erosional stability and the piping potential of the spring. Uncontrolled erosion on the upstream face and tree growth on the slopes could ultimately cause potential of failure.

b. Dam No. 2. This dam appears to be in good structural condition and is well maintained. However, the dam has a high potential of failure due to the very small capacity of the spillway. Approximately 275 feet of the dam would be overtopped by the 10-year storm for a period of 12± hours. The overtopping could cause erosion of Dam No. 2 and the toe of Dam No. 1 and possible failure of that structure. Flow through the spillway for prolonged periods could cause severe erosion of the right abutment but probably would not erode into the embankment of the dam.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

There are no controlled outlet works for these dams. The pool levels are controlled by rainfall, infiltration, evaporation, and the capacities of the uncontrolled spillways.

4.2 MAINTENANCE OF DAMS

Maintenance of the dams is deficient in the following respects:

a. Dam No. 1.

1) Unrepaired minor erosion of the upstream face of the right one-half of the dam.

2) Uncontrolled tree growth on both embankments.

3) The beaver dam across the spillway channel eliminates the effective use of the 12-inch CMP for low flow conditions.

4) Seepage flows and flow from the spring are not periodically monitored for change of color or change in volume.

b. Dam No. 2. The lack of control of erosion of the spillway is a deficiency.

4.3 MAINTENANCE OF OPERATING FACILITIES

No operating facilities exist at these dams.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

There is no warning system in effect for these dams.

4.5 EVALUATION

a. Dam No. 1. This dam has a potential failure due to prolonged overtopping of Dam No. 2 as stated in Section 3.b.5.

b. Dam No. 2. There appears to be a potential of failure of this structure due to inadequate freeboard against prolonged overtopping and potential erosion of the spillway.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

a. Design Data. No design data were available for the Windmiller Dams.

b. Experience. There are no available records of reservoir operation. The owner of the dams did report that the divider dike between the two reservoirs was built to decrease the drainage area of the main dam, as past experience had shown the storage and spillway capacity of the main dam to be inadequate.

c. Visual Observations.

1) The spillway for Dam No. 1 is located approximately 1300 feet upstream of the left abutment of the dam. The 12 inch CMP under the overflow section has been plugged by a beaver dam. The rock exit channel is in good condition.

2) Natural ground elevations near the house on the upstream side of the left abutment of Dam No. 1 are lower than the top of the dam. Mrs. Windmiller reported that water has approached the porch of the house. The high water mark observed was elevation 626.3± as compared to elevation 626.9± at the porch. The water level expected from one-half of the probable maximum flood would not cause great damage or threaten life. This area, will act as a natural spillway and discharge some flood waters to the other side of the drainage divide, prior to overtopping of the main dam.

3) The emergency spillway for the Dam No. 2 is cut through the right abutment. Discharges through this spillway will flow away from the downstream toe of the dam.

d. Overtopping Potential. According to the guidelines of the Department of the Army, Office of the Chief of Engineers, both Windmiller Dams are classified as having a high hazard rating and a small size. One half of the Probable Maximum Flood (PMF) to the PMF, therefore, is the recommended design flood for evaluation of the adequacy of the dams and their spillways.

The existing spillways will not pass the 100-year flood, the 1/2 PMF or the PMF without overtopping of the dams. Dam No. 1 spillway will pass the 10-year flood and approximately 10% of the PMF without overtopping. The spillway for Dam No. 2 will pass less than 5% of the PMF without overtopping and will not pass the 10-year flood.

The effect of overtopping on the structural and erosional stability of the dams is discussed in Section 3.1b of this report. The results of the routings are tabulated below:

Frequency	Peak Inflow Discharge c.f.s.	Peak Outflow Discharge c.f.s.	Maximum Pool Elevation	Freeboard[1]	Duration[2] of Dam Overtopping Hrs.
DAM NO. 1					
10 year	750	420	627.3	+0.1'	0
100 year	1360	1220	627.8	-0.4'	2+
0.50 PMF	3080	3080	628.4	-1.0'	7+
0.10 PMF	620	540	627.4	0.0'	0
DAM NO. 2					
10 year	270	260	628.3	-0.4'	12+
100 year	490	470	628.6	-0.7'	14+
0.50 PMF	1020	1010	629.0[3]	-1.1'	18+
0.05 PMF	100	90	628.1	-0.2'	16+
BOTH DAMS					
PMF	7280	7280	629.0	-1.6'	13+

[1] Min. Top of Dam Elev. - Dam No. 1 = 627.4
Min. Top of Dam Elev. - Dam No. 2 = 627.9

[2] Durations of dam overtopping shown do not match times shown in the HEC-1 summary output as the natural spillway of Dam No. 1 and the spillway of Dam No. 2 were included in the dam overtopping discharge rating.

[3] Maximum pool elevation overtops divider dike.

All floods resulting in a maximum pool elevation greater than 628.8 will overtop the divider dike between the two reservoirs. For the PMF, therefore, the inflow hydrograph was computed using the total drainage area for both dams, and dam overtopping ratings were computed for both dams. For floods which did not result in overtopping of the divider dike, only the drainage area and crest length of the individual dam was considered in the computations.

The drainage areas of the Windmiller Dams watershed was determined from the U.S.G.S. Millersburg SW, Missouri, 7 1/2 minute topographic quadrangle map. Reservoir surface area and elevation-storage data for both dams were determined from this map. Computations for spillway and dam overtopping discharge ratings were based on surveys made during the field inspection. Hydraulic and hydrologic computations are described in Appendix D.

The estimated downstream damage zone is described in Paragraph 1.2d of this report.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observation.

1) Dam No. 1. This dam appears to be structurally stable. Additional studies would be required to determine the effects of overtopping and seepage pressures under full loading on the stability of the structure.

2) Dam No. 2. This dam appears to be structurally stable. Additional studies would be required to determine the effects of overtopping on structural stability.

b. Design and Construction Data. No design or construction data were available. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency.

c. Operating Records. There are no controlled operating facilities for these dams.

d. Post Construction Changes. It was reported by the Owner that this project was constructed to impound one reservoir. The interconnection between reservoirs was closed by construction of a dike in 1978. The spillway for Dam No. 2 was also constructed in 1978.

e. Seismic Stability. These dams are located in Seismic Zone 1. An earthquake of the magnitude predicted in this area is not expected to cause structural failure of this dam.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

a. Safety.

1) Dam No. 1. Prolonged overtopping of Dam No. 2, causing erosion of that dam, could encroach on the toe of Dam No. 1 causing a serious potential of failure. Additional studies would be required to determine the effects of full load seepage pressures on the structural stability and of overtopping on the structural and erosional stability of the dam. Deficiencies in maintenance, trees growing on the slopes and erosion on the upstream face could result in potential of failure if left uncorrected.

2) Dam No. 2. There appears to be a serious potential of failure of this structure due to prolonged overtopping the inadequate spillway.

Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency.

b. Adequacy of Information. Due to the lack of engineering data, the conclusions in this report are based upon performance history, visual observations and on-site measurements. Seepage and stability analyses comparable to the requirements of the guidelines were not available, which is considered a deficiency.

c. Urgency. The item recommended in 7.2a(1) should be pursued immediately for both dams.

d. Necessity for Phase II. Phase II investigation is not considered necessary for either dam.

e. Seismic Stability. These dams are located in Seismic Zone 1. An earthquake of this magnitude is not expected to be hazardous to these dams.

7.2 REMEDIAL MEASURES

a. Alternatives.

1) Spillway size and/or the height of dam should be increased on both dams in order to pass 50% of the probable maximum flood without overtopping the dams. In either case, the spillways should be protected to prevent erosion.

2) Speepage discharges in the downstream abutment troughs and from the spring downstream from the toe of Dam No. 1 should be periodically monitored for change of quantity and color.

3) Seepage and slope stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams: should be made.

4) The services of an engineer experienced in the design and construction of earth dams should be obtained to perform the aforementioned studies and analyses, and to design protective measures as required.

b. O & M Procedures.

1) Dam No. 1.

a) Erosion of the upstream face should be repaired and measures taken to minimize erosion in the future.

b) Trees and shrubs should be removed from both embankments and measures taken to prevent future growth. Removal of large trees should be done under the guidance of an engineer experienced in the design and construction of earthen dams.

c) The beaver dam across the spillway channel should be eliminated and measures taken to prevent the building of a new dam at this location.

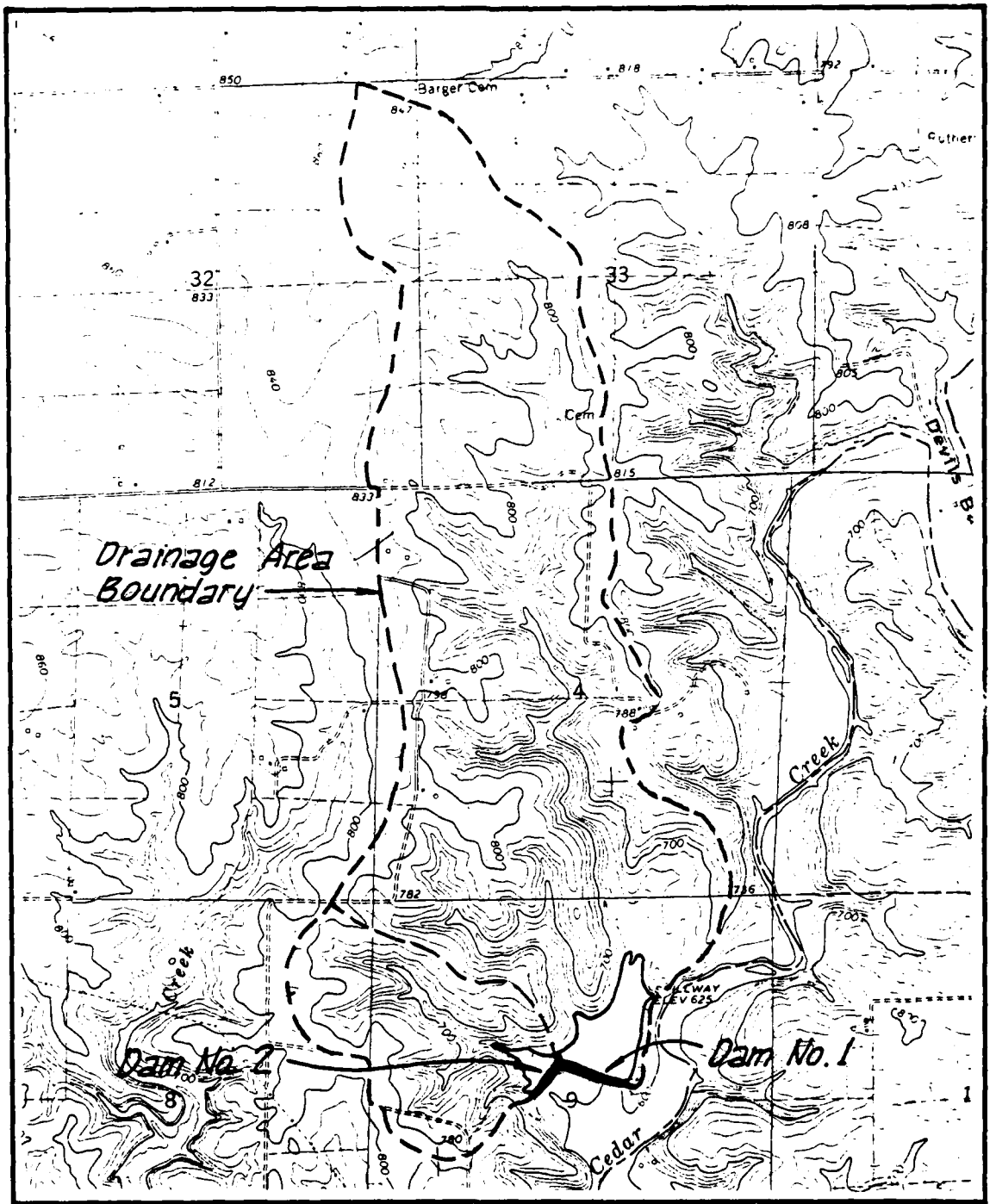
d) The 12-inch CMP low flow culvert under the concrete spillway control section (roadway) should be cleaned out in order to operate as intended.

e) Measures should be taken to determine the degree of undercutting of the spillway control section and repairs made if necessary in order to protect the owner's access to her home.

2) Dam No. 2. Maintenance of Dam No. 2 appears to be good as evidenced by the condition of the downstream embankment, the recent mowing of the crest, the recently repaired section of the dam and the general overall appearance of the dam. Maintenance of the existing spillway for this dam is of secondary importance as compared to the urgent need for additional spillway capacity in order to prevent prolonged overtopping.

3) General. A program of regular inspection and maintenance should be initiated relative to control of tree growth, control of erosion on the upstream slopes, control of beaver activities detrimental to spillway operations, control of erosion in the spillways, and including monitoring of seepage discharges.

APPENDIX A
MAPS



Scale in feet

2000 1000 0 2000 4000

Contour Interval 20 Feet

N

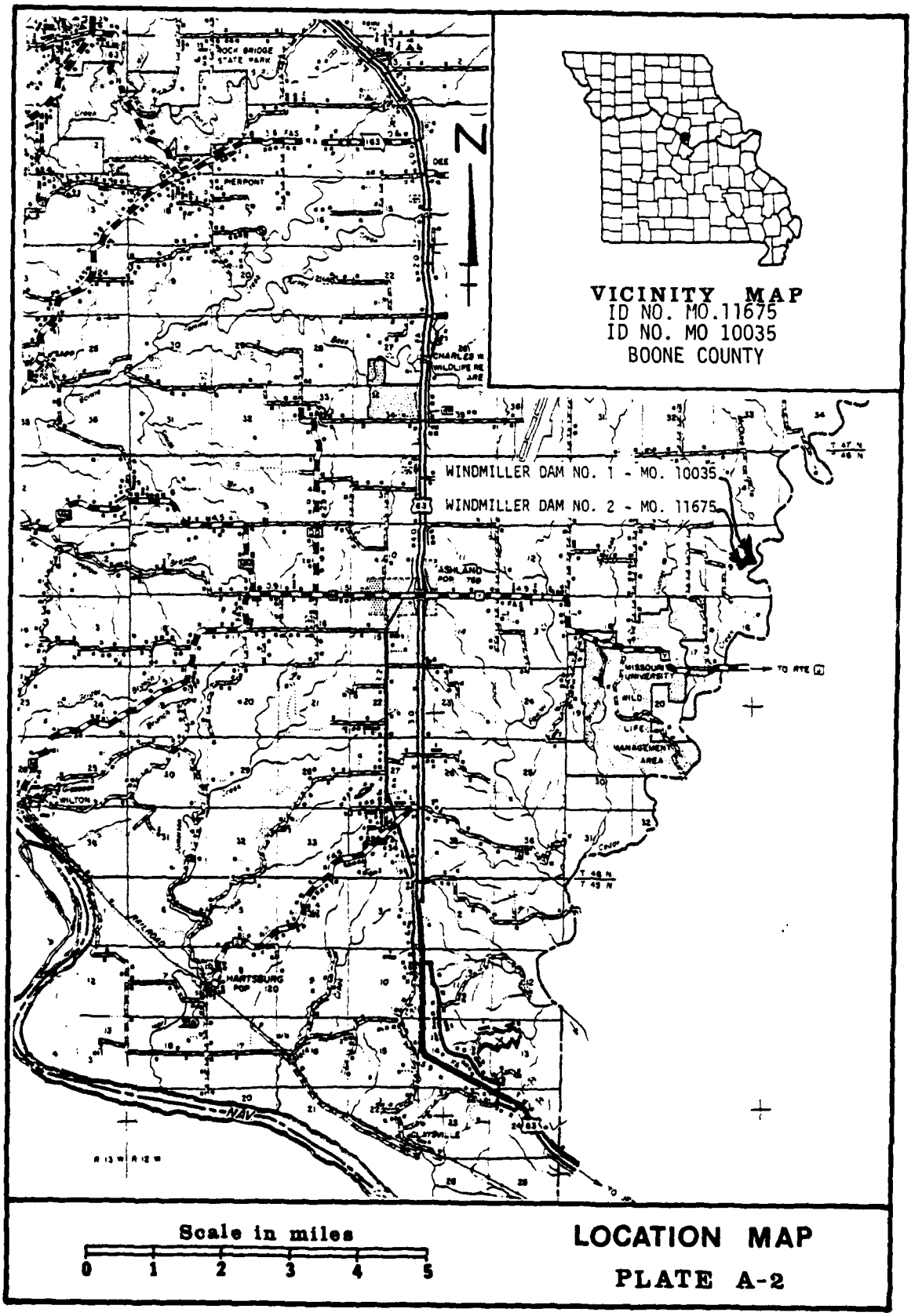
VICINITY TOPOGRAPHY

WINDMILLER DAM NO. 1 - MO. 10035

WINDMILLER DAM NO. 2 - MO. 11675

BOONE COUNTY, MISSOURI

PLATE A-1


N
VICINITY MAP
ID NO. MO.11675
ID NO. MO 10035
BOONE COUNTY
WINDMILLER DAM NO. 1 - MO. 10035
WINDMILLER DAM NO. 2 - MO. 11675
Scale in miles
0 1 2 3 4 5
LOCATION MAP
PLATE A-2

APPENDIX B
PHOTOGRAPHS

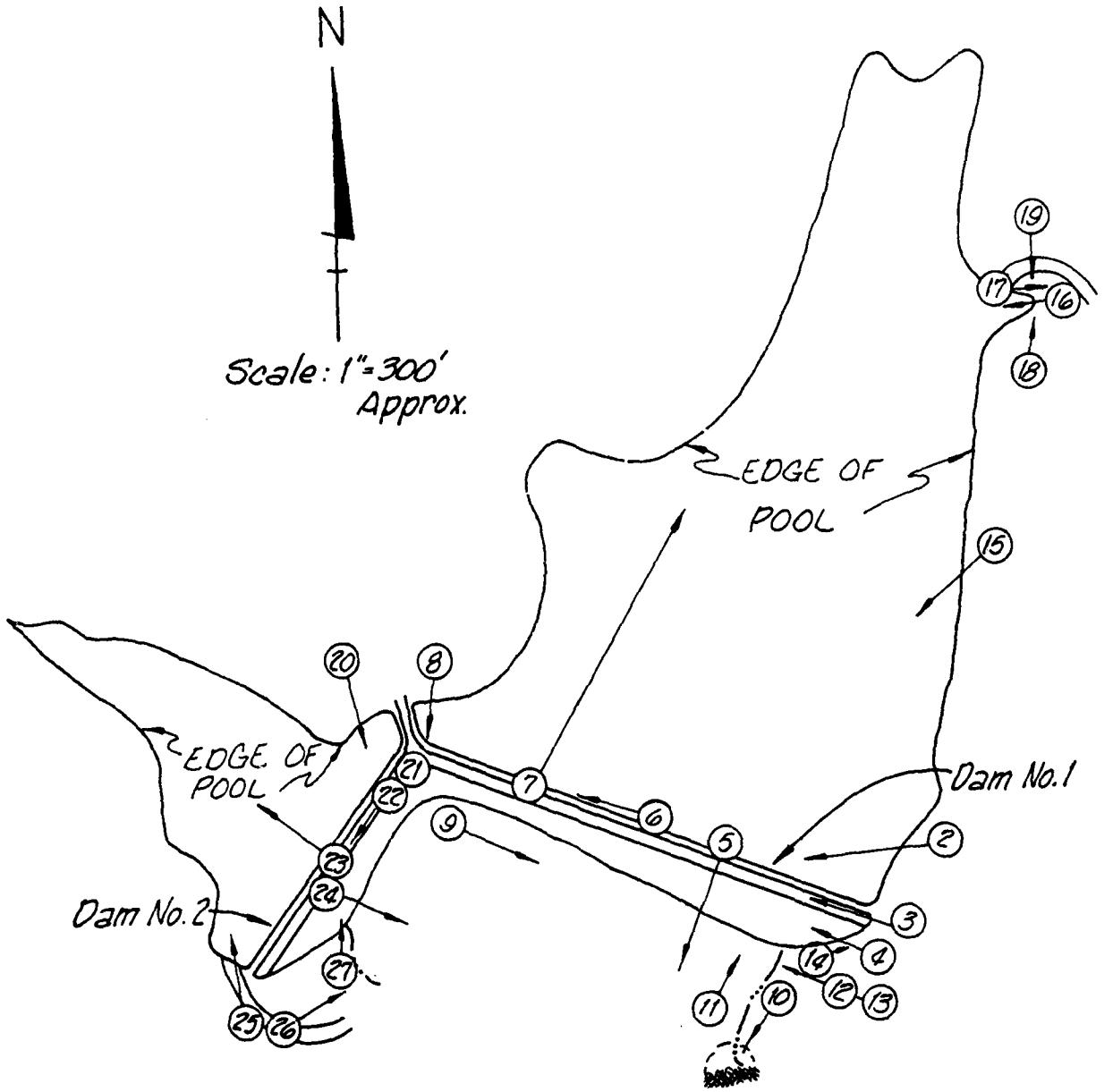


PHOTO INDEX

WINDMILLER DAM NO. 1 - MO. 10035

WINDMILLER DAM NO. 2 - MO. 11675

BOONE COUNTY, MISSOURI

PLATE B-1

PHOTO NO. 2 - UPSTREAM FACE OF DAM NO. 1 FROM LEFT ABUTMENT.

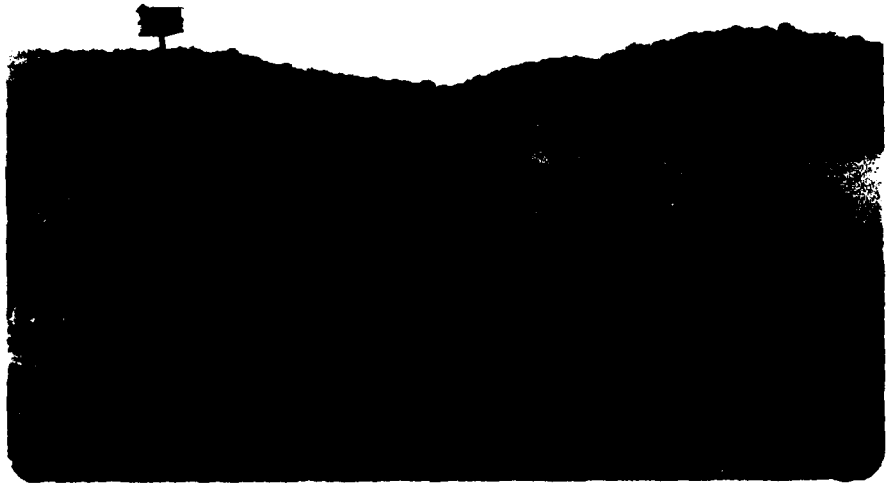


PHOTO NO. 3 - CREST OF DAM NO. 1 FROM LEFT END.

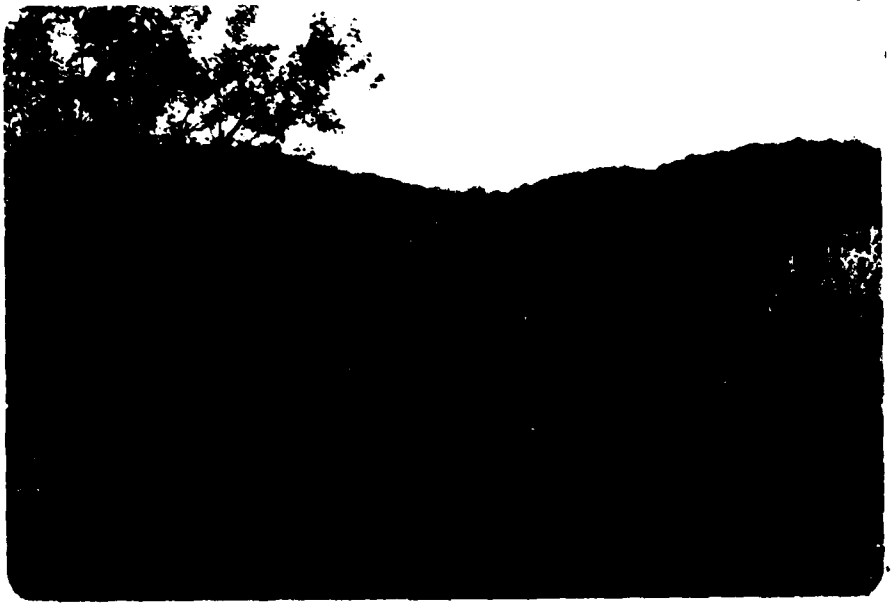


PHOTO NO. 4 - DOWNSTREAM FACE OF DAM NO. 1 TAKEN FROM LEFT ABUTMENT TROUGH.

PHOTO NO. 5 - DOWNSTREAM FROM STATION 3+50.

PHOTO NO. 6 - UPSTREAM FACE AT STA. 5+50 SHOWING EROSION.

PHOTO NO. 7 - VIEW UPSTREAM FROM STA. 7+00 ON DAM NO. 1.

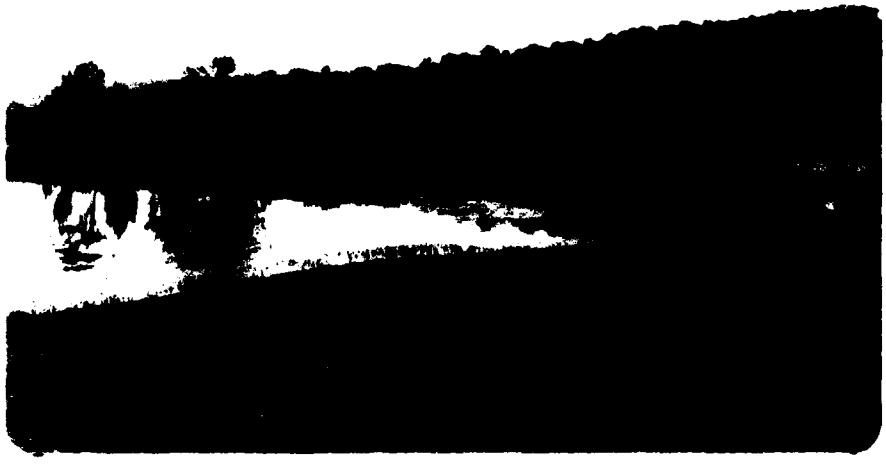


PHOTO NO. 8 - VIEW OF DIKE SEPARATING RESERVOIRS. DAM NO. 1 IN LEFT CENTER. DAM NO. 2 RIGHT CENTER.

PHOTO NO. 9 - SEEP AREA ON DOWNSTREAM SLOPE OF DAM NO. 1. PHOTO TAKEN FROM RIGHT LOOKING TOWARD LEFT.

PHOTO NO. 10 - BEAVER DAM DOWNSTREAM FROM TOE OF DAM NO. 1.

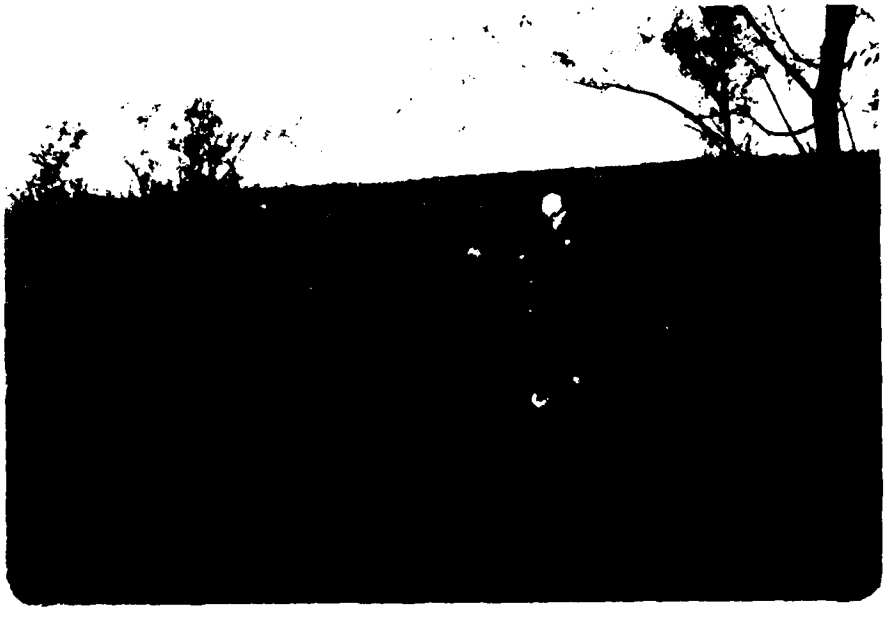


PHOTO NO. 11 - LOOKING UPSTREAM INTO DOWNSTREAM SLOPE OF DAM NO. 1.

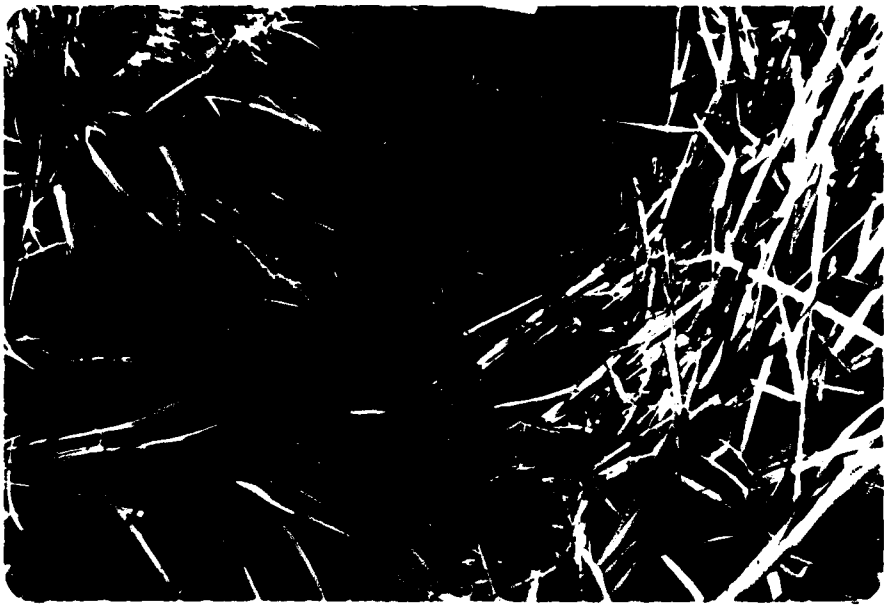


PHOTO NO. 12 - SEEPAGE DISCHARGE OPPOSITE STA. 3+50 ON DAM NO. 1.

PHOTO NO. 13 - SEEPAGE EMERGING FROM HOLE APPROXIMATELY 20 FEET DOWNSTREAM FROM TOE OPPOSITE STA. 3+00 (DAM NO. 1).

PHOTO NO. 14 - SEEP AREA IN LEFT ABUTMENT TROUGH OF DAM NO. 1.

PHOTO NO. 15 - OVERVIEW OF DAM NO. 1 FROM UPSTREAM ON LEFT SIDE.

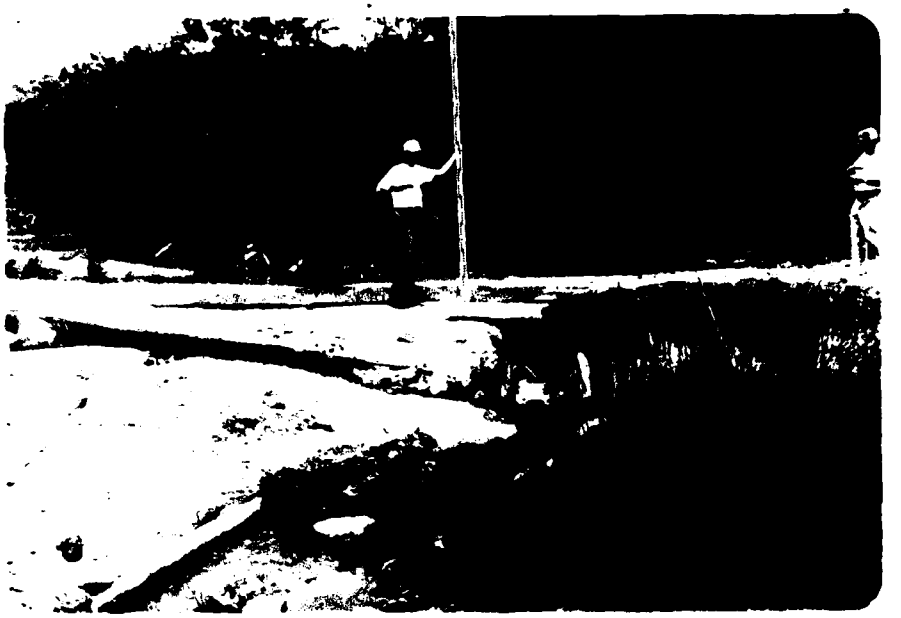


PHOTO NO. 16 - LOOKING UPSTREAM IN SPILLWAY FOR DAM NO. 1.

PHOTO NO. 17 - LOOKING DOWNSTREAM IN SPILLWAY FOR DAM NO. 1.

PHOTO NO. 18 - VIEW OF BEAVER DAM ON UPSTREAM SIDE OF CONCRETE RAMP CROSSING DAM NO. 1 SPILLWAY.

PHOTO NO. 19 - VIEW OF SPILLWAY OF DAM NO. 1 TAKEN FROM LEFT SIDE.

PHOTO NO. 20 - OVERVIEW OF DAM NO. 2 TAKEN FROM NORTH END OF LEVEE DIVIDING RESERVOIRS.

PHOTO NO. 21 - CREST OF DAM NO. 2 TAKEN FROM LEFT END.

PHOTO NO. 22 - CREST OF DAM NO. 2 SHOWING REPAIR SECTION AT CENTER.

PHOTO NO. 23 - VIEW UPSTREAM FROM DAM NO. 2.

PHOTO NO. 24 - VIEW DOWNSTREAM FROM DAM NO. 2.

PHOTO NO. 25 - VIEW UPSTREAM IN SPILLWAY FOR DAM NO. 2.

PHOTO NO. 26 - VIEW DOWNSTREAM IN SPILLWAY FOR DAM NO. 2.

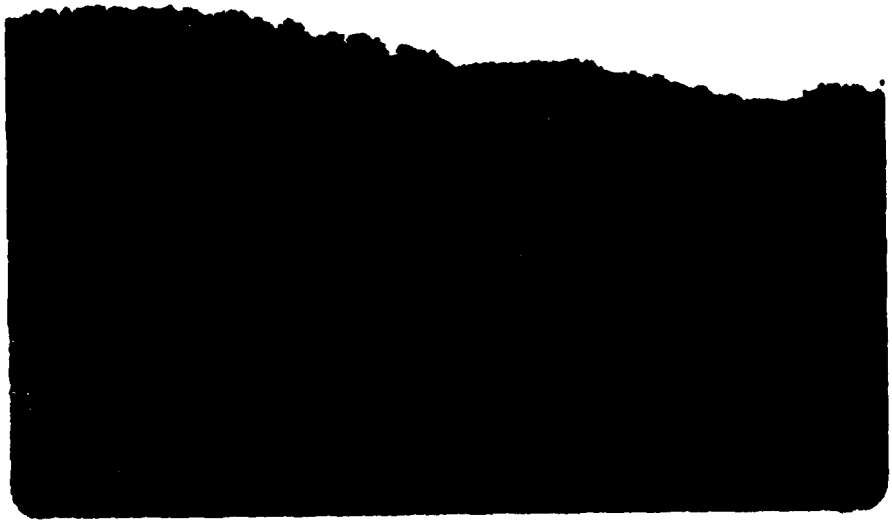
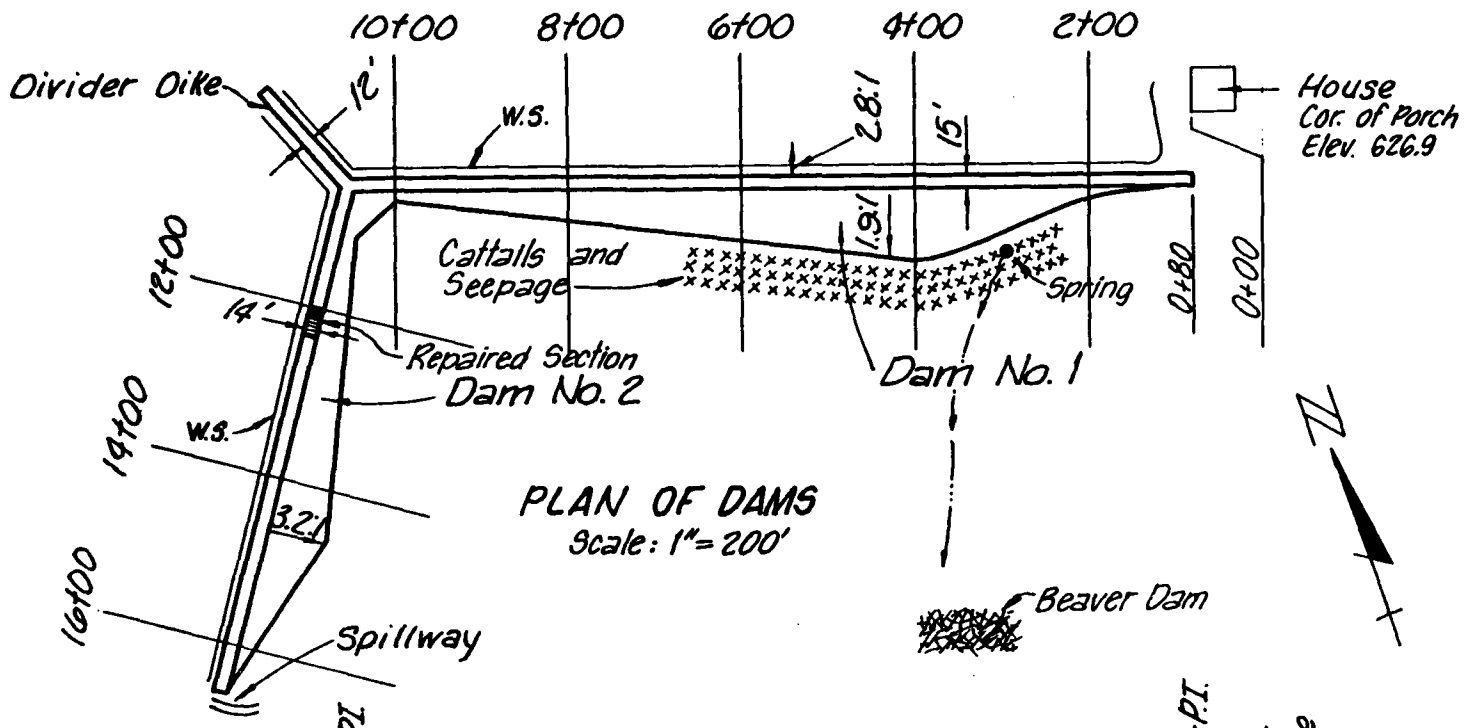
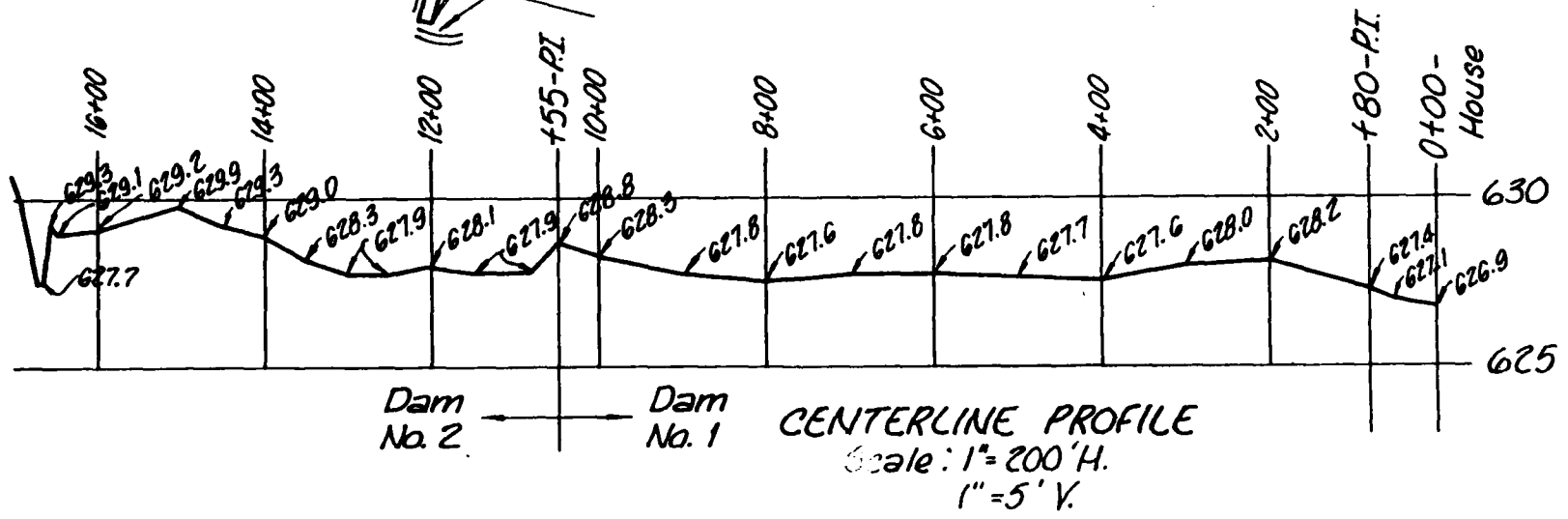


PHOTO NO. 27 - DOWNSTREAM SLOPE OF DAM NO. 2 TAKEN FROM RIGHT END.

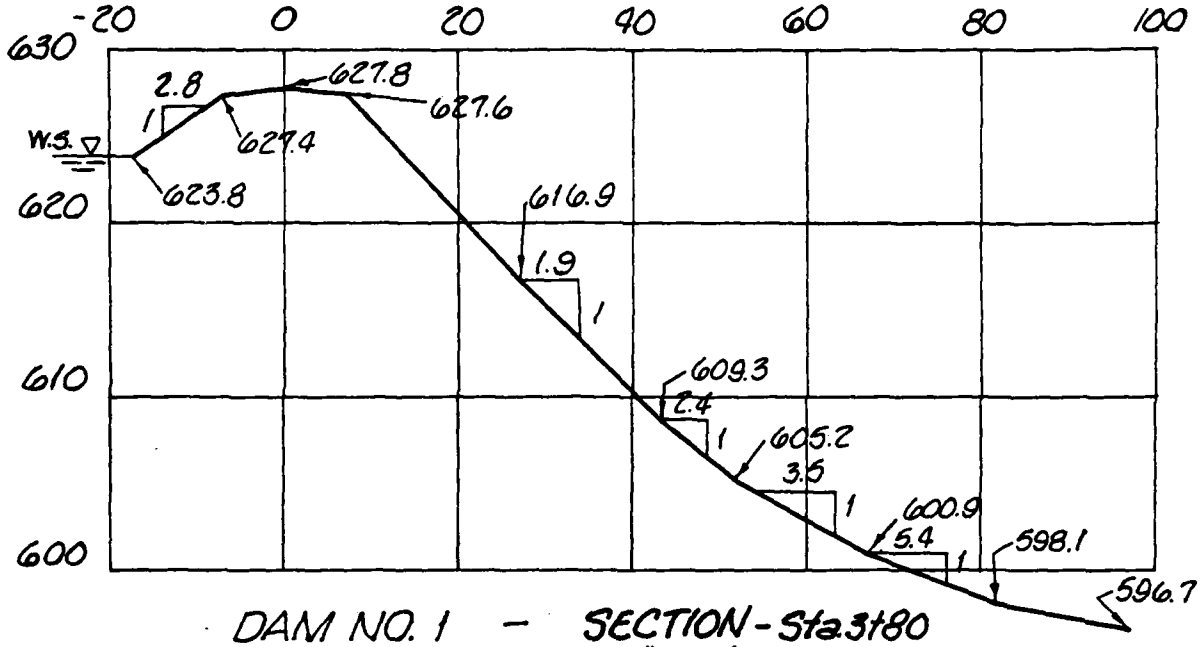
APPENDIX C
PROJECT PLATES



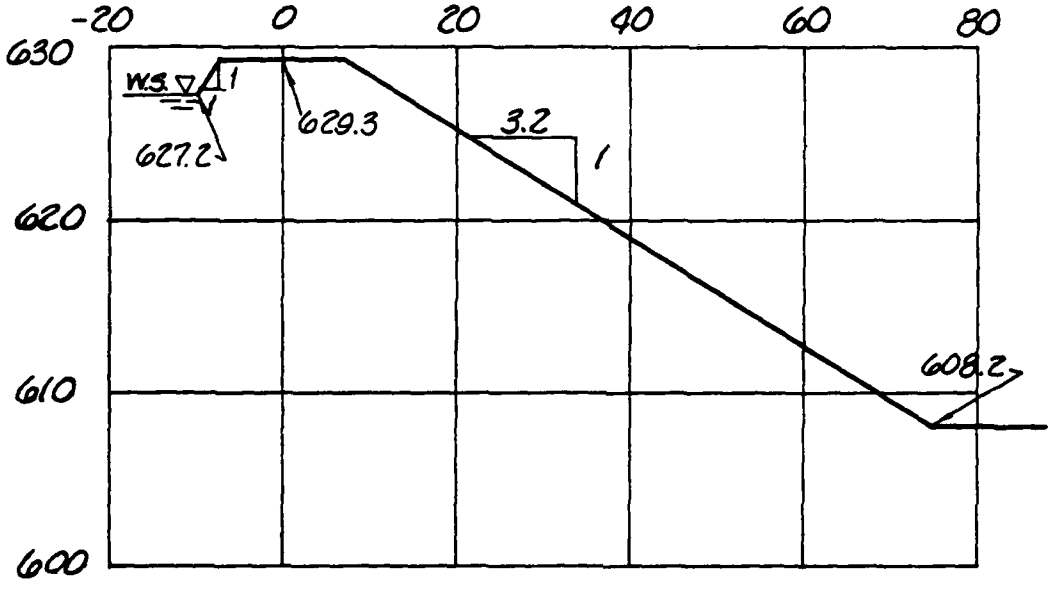


CENTERLINE PROFILE
Scale: 1"= 200' H.
1"= 5' V.

PLATE C-1

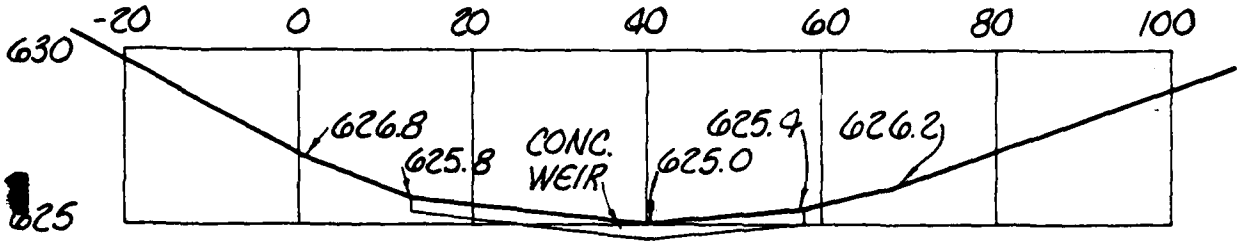


DAM NO. 1 – SECTION - Sta. 3+80
Scale: 1"=20' H.
1"=10' V.

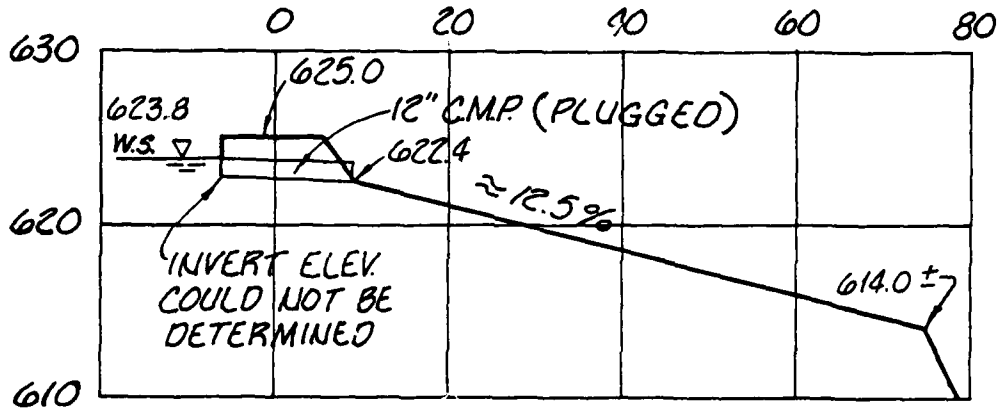


DAM NO. 2 – SECTION - Sta. 14+55
Scale: 1"=20' H.
1"=10' V.

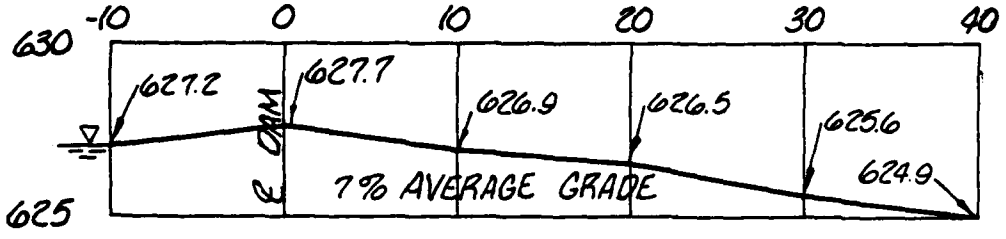
PLATE C-2



SPILLWAY SECTION- DAM NO. 1
Scale: 1"=20'H.
1"=5'V.

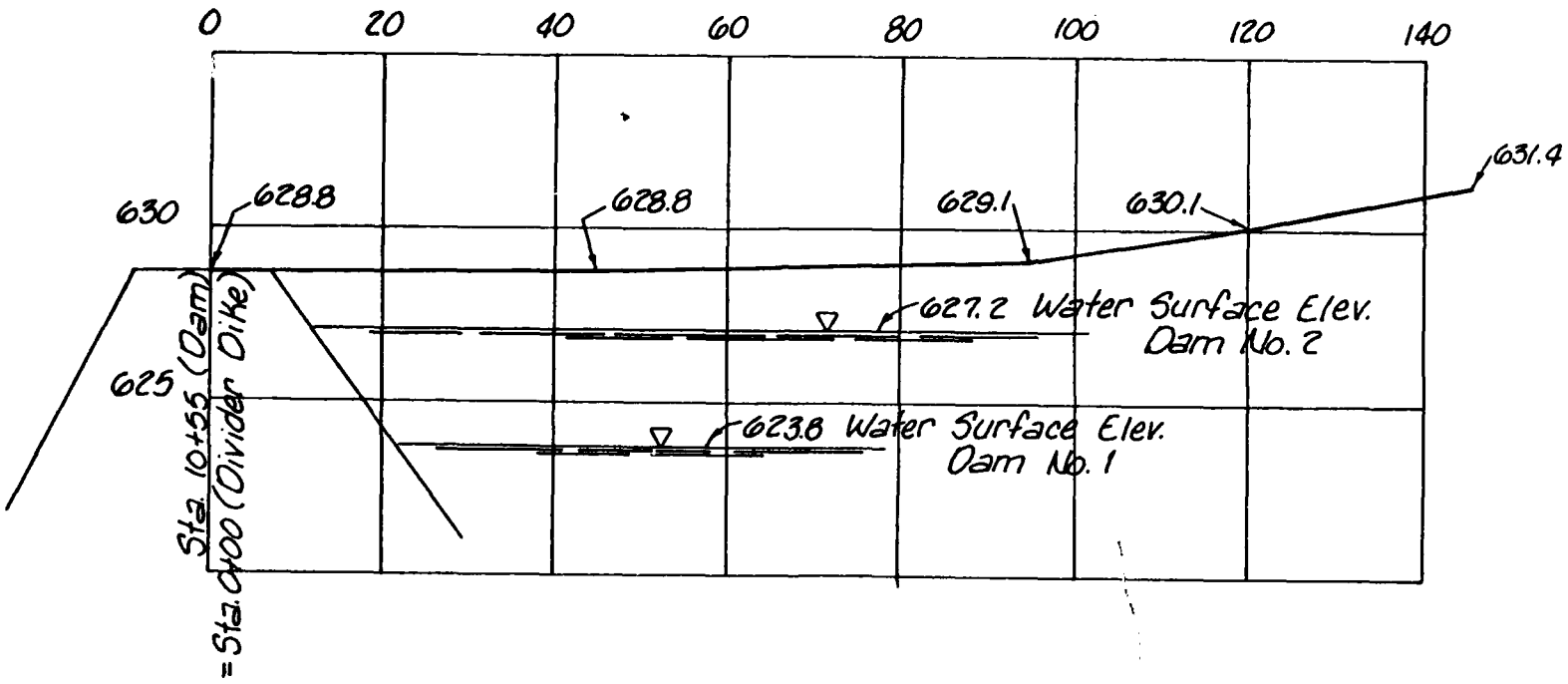


SPILLWAY PROFILE- DAM NO. 1
Scale: 1"=20'H.
1"=10'V.



SPILLWAY PROFILE- DAM NO. 2
Scale: 1"=10'H.
1"=5'V.

PLATE C-3



DIVIDER DIKE PROFILE

Scale: 1" = 20' H.
1" = 5' V.

PLATE C-4

APPENDIX D
HYDRAULIC AND HYDROLOGIC DATA

HYDROLOGIC COMPUTATIONS

1. The SCS dimensionless unit hydrograph and the systemized computer Program HEC-1 (Dam Safety Version), July, 1978, prepared by the Hydrologic Engineering Center, U.S. Army Corps of Engineers, Davis, California, were used to develop the inflow hydrographs.

   a. The 24-hour, 10-year and 100-year rainfalls for the dam locations were taken from the data for the rainfall station at Jefferson City, Missouri, as supplied by the St. Louis District, Corps of Engineers, per their letter dated 6 March 1979. The 48-hour probable maximum precipitation was taken from the curves of Hydrometeorological Report No. 33 and current Corps of Engineers and St. Louis District policy and guidance for hydraulics and hydrology.

   b. Drainage area = 1.33 square miles (851 acres) for the main dam. Drainage area = 0.24 square miles (154 acres) for the small dam.

   c. Time of concentration of runoff = 1.80 hours for the main dam and 0.58 hours for the small dam, both computed by SCS methods.

   d. Antecedent moisture conditions for the probable maximum flood were assumed to be heavy rainfall and low temperatures for the previous five days (SCS AMC III). Antecedent moisture conditions for the 10-year and 100-year floods were assumed to be an average of the conditions which have preceded the occurrence of the maximum annual flood on numerous watersheds (SCS AMC II).

   e. Initial pool elevation for the main dam was assumed to be at the spillway crest (Elev. 625.0). Initial pool elevation for the small dam was also assumed to be at the spillway crest (Elev. 627.7).

   f. Total losses for the 24-hour 100-year storm were 2.90 inches Total losses for the 48-hour PMP for the main dam were 1.58 inches. Total losses for the 24-hour PMP for the small dam were also 1.58 inches. The average loss rate for the 48-hour PMP for the main dam was 0.03 inch per hour. The average loss rate for the 24-hour PMP for the small dam was 0.07 inch per hour. Losses were determined using

SCS CN 75 (AMC II) for the 24-hour, 100-year storm and SCS CN 88 (AMC III) for the PMP. Soils in the watershed are composed of approximately 7% SCS Soil Group B, 59% Soil Group C, and 34% Soil Group D. Land use in the watershed is approximately 80% woods and 20% cropland.

2. The discharge rating for the main dam spillway was determined using the broad-crested weir equation. The discharge coefficient "C" was varied according to head. (Reference: "Measurement of Peak Discharge at Dams By Indirect Methods, U.S.G.S.). The values for "C" ranged from 2.6 to 2.7.

   The discharge ratings for the dam crests, for the natural spillway upstream of the left abutment of the main dam, and for the small dam emergency spillway were developed using the option of the HEC-1 (Dam Safety Version) program for flow over a non-level dam crest.

3. Floods were routed through the reservoirs using the HEC-1 (Dam Safety Version) program. Input, Output, and plotted hydrographs are included with this report. As noted in Section 5 of this report, times of dam overtopping shown in the HEC-1 output summaries include flows over the natural spillway upstream of the left abutment of the main dam and flow through the emergency spillway of the small dam. Actual times of dam overtopping were determined from the detailed listing of reservoir routing computations.

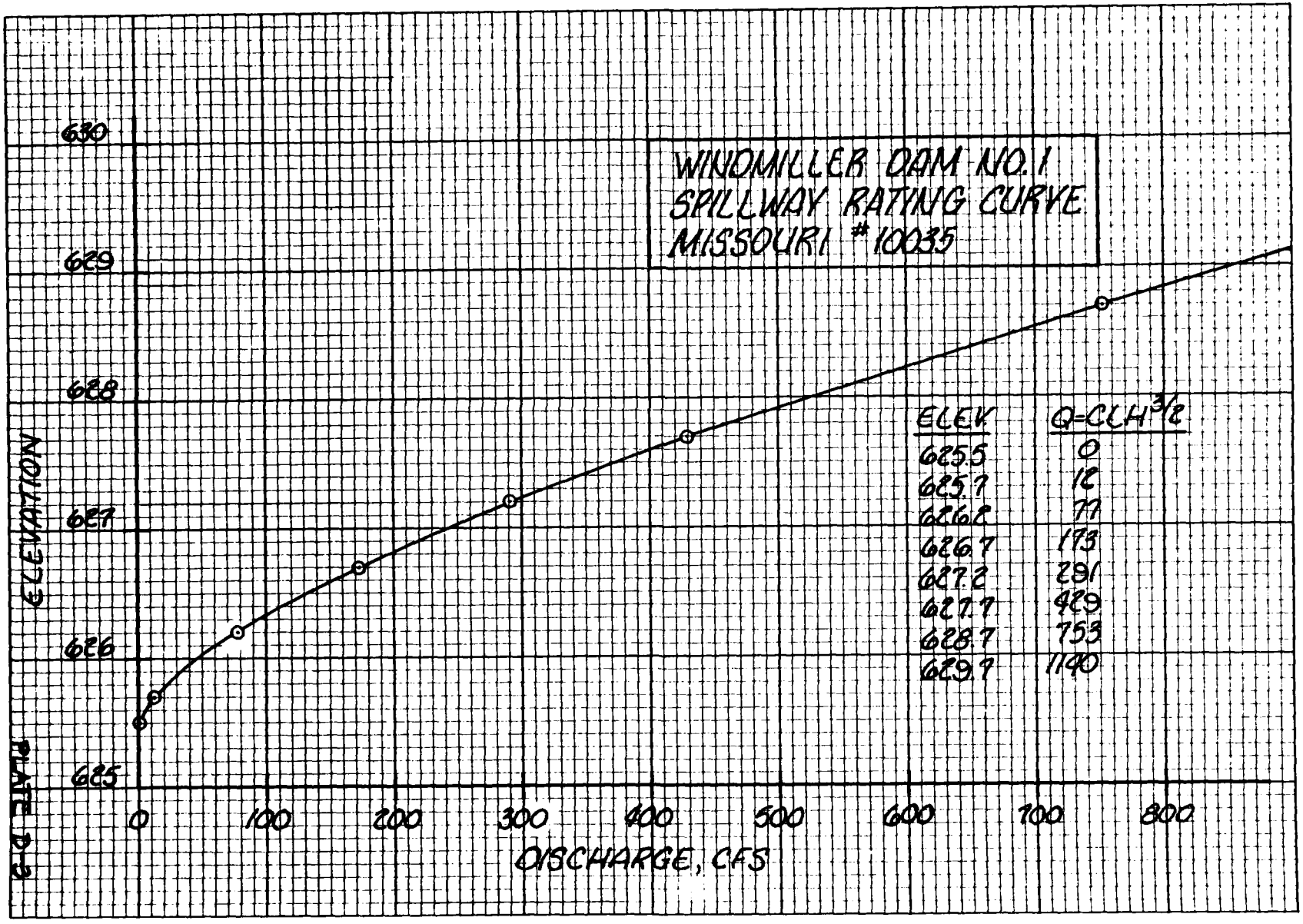
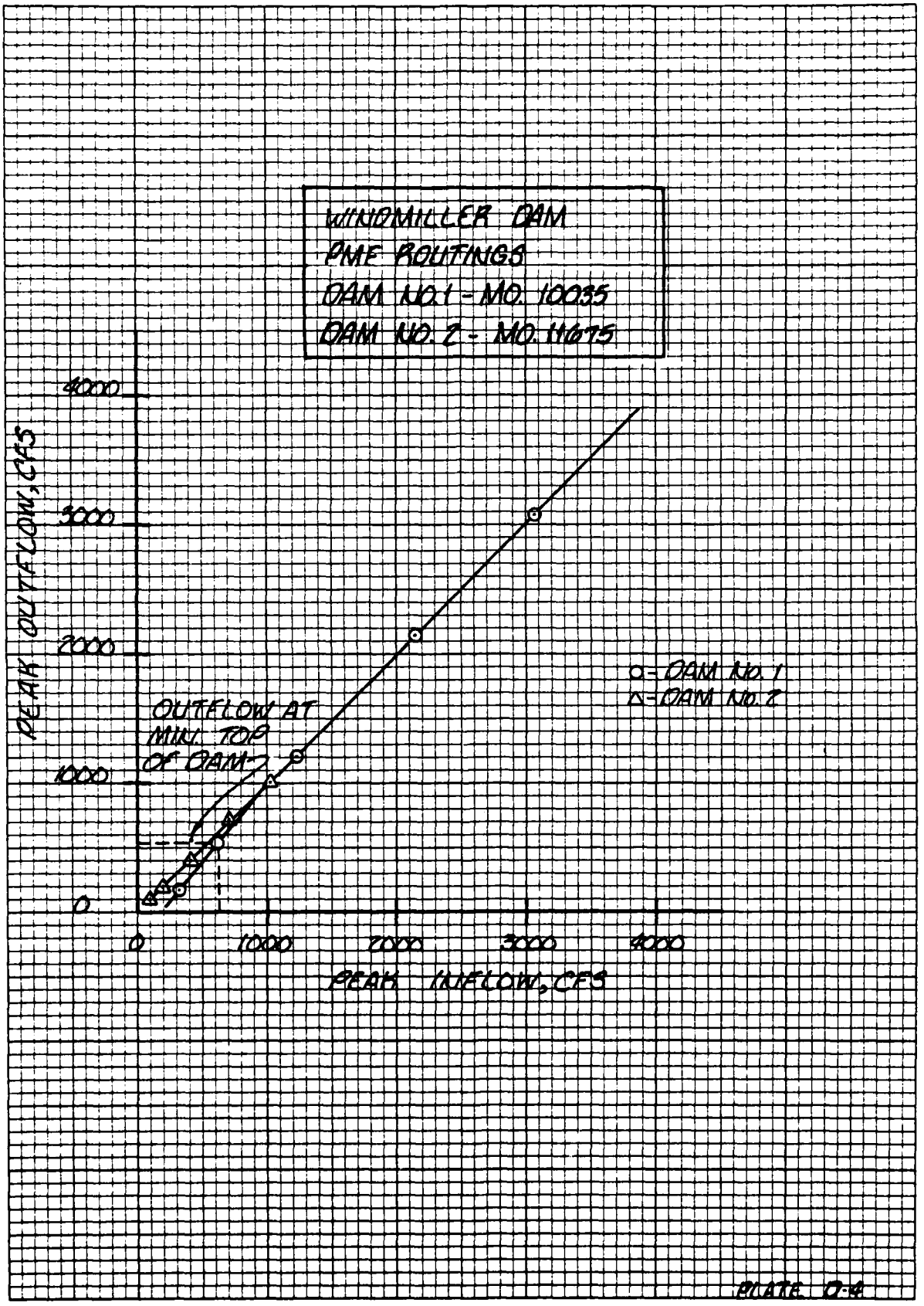

WINDMILLER DAM NO. 1
SPILLWAY RATING CURVE
MISSOURI #10035
ELEV
Q=CLH^3/2
625.5 0
625.7 12
626.2 71
626.7 173
627.2 291
627.7 429
628.7 753
629.7 1140
ELEVATION
630
629
628
627
626
625
0
100
200
300
400
500
600
700
800
DISCHARGE, CFS

PLATE #13


WINOMILLER DAM
PMF ROUTINGS
DAM NO. 1 - MO. 10035
DAM NO. 2 - MO. 11675
PEAK OUTFLOW, CFS
4000
3000
2000
1000
0
OUTFLOW AT
MIN. TOP
OF DAM
O=DAM NO. 1
Δ=DAM NO. 2
0
1000
2000
3000
4000
PEAK INFLOW, CFS
PLATE O-4

```
A1       MISSOURI DAM SAFETY INSPECTIONS
A2       WINDMILLER DAM MO 10035
A3       RATIOS OF PMF - MAIN DAM ONLY
B    192         0       15
B1000005
J        1       5       1
J1    .05      .10     .20     .35     .50
K 00000000000001                    0000000200000000000000001
K1       CALCULATION OF INFLOW HYDROGRAPH TO WINDMILLER DAM
M        1       2    1.33                  0     1.0                        1
P 000000000024.80000102.0000121.C000130.0000140.
T                                                    -1.     -88.
M2            1.08
X             -.10      3.
K 00000100000002                    0C0000020000000000000001
K1       RESERVOIR ROUTING OF HYDROGRAPHS THRU WINDMILLER DAM
Y                          00000001CC0C0001
Y1       1                                          -625.0       -1
Y4 625.0    625.7    626.2    626.7    627.2    627.7    628.7    629.7    630.7
YS    0.     12.      77.     173.     291.     429.     753.    1140.    1583.
$S    0.    215.     743.
$E  600.   623.7    640.
$$ 625.0
$D 626.9      3.0      1.5   1055.
$L    0.    630.   1000.   1055.
$V 626.9   627.7   628.2   628.8
K     99
A
A
A
A
A
```

PLATE D-5

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
 LAST MODIFICATION  26 FEB 79
**********************************

RUN  DATE= 79/08/20.
     TIME= 13.04.51.

                    MISSOURI DAM SAFETY INSPECTIONS
                    WINDMILLER DAM NO 10035
                    RATIOS OF PMF - MAIN DAM ONLY

                                 JOB SPECIFICATION
     NQ      NHR     NMIN     IDAY      IHR     IMIN    METRC     IPLT     IPRT    NSTAN
    192        0       15        0        0        0        0        0        0        0
                             JOPER      NWT    LROPT    TRACE
                                 5        0        0        0

                         MULTI-PLAN ANALYSES TO BE PERFORMED
                             NPLAN= 1 NRTIO= 5 LRTIO= 1
     RTIOS=     .05      .10      .20      .35      .50

**********          **********          **********          **********          **********

                            SUB-AREA RUNOFF COMPUTATION

                  CALCULATION OF INFLOW HYDROGRAPH TO WINDMILLER DAM

                  ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                 C00001        0        0        0        2        0        1        0        0

                                  HYDROGRAPH DATA
    IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
        1        2     1.33     0.00     1.33     1.00    0.000        0        1        0

                                    PRECIP DATA
             SPFE      PMS       R6      R12      R24      R48      R72      R96
             0.00    24.80   102.00   121.00   130.00   140.00     0.00     0.00

                                     LOSS DATA
   LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
       0     0.00     0.00     1.00     0.00     0.00     1.00    -1.00   -88.00     0.00     0.00

     CURVE NO =  -88.00   WETNESS =   -1.00   EFFECT CN =   88.00

                                UNIT HYDROGRAPH DATA
                             TC=  0.00     LAG=  1.08

                                   RECESSION DATA
                      STRTQ=    0.00     QRCSN=     -.10     RTIOR= 3.00

     UNIT HYDROGRAPH 24 END OF PERIOD ORDINATES, TC=     0.00 HOURS, LAG=   1.08  VOL= 1.00
      57.     178.     371.     505.     531.     479.     388.     267.     186.     135.
      97.      69.      49.      35.      25.      18.      13.       9.       6.       5.
       4.       2.       1.       0.
```

PLATE D-6

PLATE D-7

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.15	1	.00	0.00	.00	0.	1.02	.15	97	.04	.03	.01	14.
1.01	.30	2	.00	0.00	.00	0.	1.02	.30	98	.04	.03	.01	19.
1.01	.45	3	.00	0.00	.00	0.	1.02	.45	99	.04	.03	.01	30.
1.01	1.00	4	.00	0.00	.00	0.	1.02	1.00	100	.04	.03	.01	44.
1.01	1.15	5	.00	0.00	.00	0.	1.02	1.15	101	.04	.03	.00	59.
1.01	1.30	6	.00	0.00	.00	0.	1.02	1.30	102	.04	.03	.00	73.
1.01	1.45	7	.00	0.00	.00	0.	1.02	1.45	103	.04	.03	.00	84.
1.01	2.00	8	.00	0.00	.00	0.	1.02	2.00	104	.04	.03	.00	92.
1.01	2.15	9	.00	0.00	.00	0.	1.02	2.15	105	.04	.03	.00	97.
1.01	2.30	10	.00	0.00	.00	0.	1.02	2.30	106	.04	.03	.00	101.
1.01	2.45	11	.00	0.00	.00	0.	1.02	2.45	107	.04	.03	.00	104.
1.01	3.00	12	.00	0.00	.00	0.	1.02	3.00	108	.04	.03	.00	107.
1.01	3.15	13	.00	0.00	.00	0.	1.02	3.15	109	.04	.03	.00	108.
1.01	3.30	14	.00	0.00	.00	0.	1.02	3.30	110	.04	.03	.00	110.
1.01	3.45	15	.00	0.00	.00	0.	1.02	3.45	111	.04	.03	.00	110.
1.01	4.00	16	.00	0.00	.00	0.	1.02	4.00	112	.04	.03	.00	111.
1.01	4.15	17	.00	0.00	.00	0.	1.02	4.15	113	.04	.03	.00	112.
1.01	4.30	18	.00	0.00	.00	0.	1.02	4.30	114	.04	.03	.00	112.
1.01	4.45	19	.00	0.00	.00	0.	1.02	4.45	115	.04	.03	.00	113.
1.01	5.00	20	.00	0.00	.00	0.	1.02	5.00	116	.04	.03	.00	113.
1.01	5.15	21	.00	0.00	.00	0.	1.02	5.15	117	.04	.03	.00	114.
1.01	5.30	22	.00	0.00	.00	0.	1.02	5.30	118	.04	.03	.00	114.
1.01	5.45	23	.00	0.00	.00	0.	1.02	5.45	119	.04	.03	.00	114.
1.01	6.00	24	.00	0.00	.00	0.	1.02	6.00	120	.04	.03	.00	114.
1.01	6.15	25	.02	0.00	.02	0.	1.02	6.15	121	.20	.18	.02	123.
1.01	6.30	26	.02	0.00	.02	0.	1.02	6.30	122	.20	.18	.02	149.
1.01	6.45	27	.02	0.00	.02	0.	1.02	6.45	123	.20	.18	.01	203.
1.01	7.00	28	.02	0.00	.02	0.	1.02	7.00	124	.20	.18	.01	278.
1.01	7.15	29	.02	0.00	.02	0.	1.02	7.15	125	.20	.18	.01	356.
1.01	7.30	30	.02	0.00	.02	0.	1.02	7.30	126	.20	.18	.01	428.
1.01	7.45	31	.02	0.00	.02	0.	1.02	7.45	127	.20	.19	.01	487.
1.01	8.00	32	.02	0.00	.02	0.	1.02	8.00	128	.20	.19	.01	528.
1.01	8.15	33	.02	0.00	.02	0.	1.02	8.15	129	.20	.19	.01	558.
1.01	8.30	34	.02	0.00	.02	0.	1.02	8.30	130	.20	.19	.01	581.
1.01	8.45	35	.02	0.00	.02	0.	1.02	8.45	131	.20	.19	.01	597.
1.01	9.00	36	.02	0.00	.02	0.	1.02	9.00	132	.20	.19	.01	610.
1.01	9.15	37	.02	0.00	.02	0.	1.02	9.15	133	.20	.19	.01	620.
1.01	9.30	38	.02	.00	.02	0.	1.02	9.30	134	.20	.19	.01	627.
1.01	9.45	39	.02	.00	.01	0.	1.02	9.45	135	.20	.19	.01	633.
1.01	10.00	40	.02	.00	.01	0.	1.02	10.00	136	.20	.19	.01	637.
1.01	10.15	41	.02	.00	.01	0.	1.02	10.15	137	.20	.19	.01	641.
1.01	10.30	42	.02	.00	.01	1.	1.02	10.30	138	.20	.19	.01	644.
1.01	10.45	43	.02	.00	.01	1.	1.02	10.45	139	.20	.19	.01	646.
1.01	11.00	44	.02	.00	.01	2.	1.02	11.00	140	.20	.19	.01	648.
1.01	11.15	45	.02	.00	.01	3.	1.02	11.15	141	.20	.19	.01	650.
1.01	11.30	46	.02	.00	.01	3.	1.02	11.30	142	.20	.19	.00	652.
1.01	11.45	47	.02	.00	.01	4.	1.02	11.45	143	.20	.19	.00	653.
1.01	12.00	48	.02	.00	.01	5.	1.02	12.00	144	.20	.19	.00	654.
1.01	12.15	49	.05	.01	.04	6.	1.02	12.15	145	.63	.62	.01	679.
1.01	12.30	50	.05	.01	.04	9.	1.02	12.30	146	.63	.62	.01	756.
1.01	12.45	51	.05	.02	.03	13.	1.02	12.45	147	.63	.62	.01	916.
1.01	13.00	52	.05	.02	.03	19.	1.02	13.00	148	.63	.62	.01	1133.
1.01	13.15	53	.06	.02	.04	26.	1.02	13.15	149	.76	.75	.01	1370.
1.01	13.30	54	.06	.03	.03	35.	1.02	13.30	150	.76	.75	.01	1599.
1.01	13.45	55	.06	.03	.03	44.	1.02	13.45	151	.76	.75	.01	1814.
1.01	14.00	56	.06	.03	.03	53.	1.02	14.00	152	.76	.75	.01	1994.
1.01	14.15	57	.07	.04	.03	63.	1.02	14.15	153	.95	.94	.01	2154.
1.01	14.30	58	.07	.04	.03	73.	1.02	14.30	154	.95	.94	.01	2308.
1.01	14.45	59	.07	.04	.03	85.	1.02	14.45	155	.95	.94	.01	2471.

1.01	15.00	60	.07	.05	.03	97.	1.02	15.00	156	.95	.94	.01	2632.
1.01	15.15	61	.07	.05	.03	109.	1.02	15.15	157	.96	.96	.00	2780.
1.01	15.30	62	.15	.10	.05	123.	1.02	15.30	158	1.92	1.91	.01	2962.
1.01	15.45	63	.41	.31	.11	154.	1.02	15.45	159	5.38	5.37	.02	3431.
1.01	16.00	64	.10	.08	.02	206.	1.02	16.00	160	1.35	1.34	.00	4247.
1.01	16.15	65	.07	.05	.01	274.	1.02	16.15	161	.89	.88	.00	5325.
1.01	16.30	66	.07	.05	.01	323.	1.02	16.30	162	.89	.88	.00	6044.
1.01	16.45	67	.07	.06	.01	337.	1.02	16.45	163	.89	.88	.00	6163.
1.01	17.00	68	.07	.06	.01	326.	1.02	17.00	164	.89	.88	.00	5841.
1.01	17.15	69	.05	.04	.01	300.	1.02	17.15	165	.70	.69	.00	5268.
1.01	17.30	70	.05	.04	.01	265.	1.02	17.30	166	.70	.69	.00	4564.
1.01	17.45	71	.05	.04	.01	238.	1.02	17.45	167	.70	.69	.00	4022.
1.01	18.00	72	.05	.05	.01	217.	1.02	18.00	168	.70	.69	.00	3618.
1.01	18.15	73	.00	.00	.00	198.	1.02	18.15	169	.06	.06	.00	3258.
1.01	18.30	74	.00	.00	.00	178.	1.02	18.30	170	.06	.06	.00	2888.
1.01	18.45	75	.00	.00	.00	153.	1.02	18.45	171	.06	.06	.00	2462.
1.01	19.00	76	.00	.00	.00	125.	1.02	19.00	172	.06	.06	.00	2004.
1.01	19.15	77	.00	.00	.00	98.	1.02	19.15	173	.06	.06	.00	1570.
1.01	19.30	78	.00	.00	.00	75.	1.02	19.30	174	.06	.06	.00	1197.
1.01	19.45	79	.00	.00	.00	57.	1.02	19.45	175	.06	.06	.00	900.
1.01	20.00	80	.00	.00	.00	44.	1.02	20.00	176	.06	.06	.00	695.
1.01	20.15	81	.00	.00	.00	35.	1.02	20.15	177	.06	.06	.00	587.
1.01	20.30	82	.00	.00	.00	31.	1.02	20.30	178	.06	.06	.00	526.
1.01	20.45	83	.00	.00	.00	28.	1.02	20.45	179	.06	.06	.00	471.
1.01	21.00	84	.00	.00	.00	25.	1.02	21.00	180	.06	.06	.00	422.
1.01	21.15	85	.00	.00	.00	22.	1.02	21.15	181	.06	.06	.00	378.
1.01	21.30	86	.00	.00	.00	20.	1.02	21.30	182	.06	.06	.00	339.
1.01	21.45	87	.00	.00	.00	18.	1.02	21.45	183	.06	.06	.00	304.
1.01	22.00	88	.00	.00	.00	16.	1.02	22.00	184	.06	.06	.00	272.
1.01	22.15	89	.00	.00	.00	14.	1.02	22.15	185	.06	.06	.00	244.
1.01	22.30	90	.00	.00	.00	13.	1.02	22.30	186	.06	.06	.00	218.
1.01	22.45	91	.00	.00	.00	13.	1.02	22.45	187	.06	.06	.00	199.
1.01	23.00	92	.00	.00	.00	13.	1.02	23.00	188	.06	.06	.00	196.
1.01	23.15	93	.00	.00	.00	13.	1.02	23.15	189	.06	.06	.00	194.
1.01	23.30	94	.00	.00	.00	13.	1.02	23.30	190	.06	.06	.00	192.
1.01	23.45	95	.00	.00	.00	13.	1.02	23.45	191	.06	.06	.00	191.
1.02	0.00	96	.00	.00	.00	13.	1.03	0.00	192	.06	.06	.00	191.
									SUM	34.72	33.14	1.58	113403.
										(882.)(	842.)(	40.)(	3211.22)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6163.	3388.	1132.	590.	113309.
CMS	175.	96.	32.	17.	3209.
INCHES		23.70	31.67	33.02	33.02
MM		601.96	804.44	838.74	838.74
AC-FT		1680.	2245.	2341.	2341.
THOUS CU M		2072.	2770.	2888.	2888.

PLATE D-8

UVN

HYDROGRAPH AT STA0000001 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	2.	2.	3.	3.	4.	4.	5.
5.	6.	8.	10.	14.	16.	17.	16.	15.	13.
12.	11.	10.	9.	8.	6.	5.	4.	3.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
3.	4.	4.	5.	5.	5.	5.	5.	5.	5.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
6.	7.	10.	14.	18.	21.	24.	26.	28.	29.
30.	30.	31.	31.	32.	32.	32.	32.	32.	32.
33.	33.	33.	33.	34.	38.	46.	57.	68.	80.
91.	100.	108.	115.	124.	132.	139.	148.	172.	212.
266.	302.	308.	292.	263.	228.	201.	181.	163.	144.
123.	100.	78.	60.	45.	35.	29.	26.	24.	21.
19.	17.	15.	14.	12.	11.	10.	10.	10.	10.
10.	10.								

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	308.	169.	57.	30.	5665.
CMS	9.	5.	2.	1.	160.
INCHES		1.18	1.58	1.65	1.65
MM		30.10	40.22	41.94	41.94
AC-FT		84.	112.	117.	117.
THOUS CU M		104.	138.	144.	144.

HYDROGRAPH AT STA0000001 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
1.	2.	3.	3.	4.	5.	6.	7.	8.	10.
11.	12.	15.	21.	27.	32.	34.	33.	30.	26.
24.	22.	20.	18.	15.	13.	10.	8.	6.	4.
3.	3.	3.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	2.	3.	4.
6.	7.	8.	9.	10.	10.	10.	11.	11.	11.
11.	11.	11.	11.	11.	11.	11.	11.	11.	11.
12.	15.	20.	28.	36.	43.	49.	53.	56.	58.
60.	61.	62.	63.	63.	64.	64.	64.	65.	65.
65.	65.	65.	65.	68.	76.	92.	113.	137.	160.
181.	199.	215.	231.	247.	263.	278.	296.	343.	425.
532.	604.	616.	584.	527.	456.	402.	362.	326.	289.
246.	200.	157.	120.	90.	69.	59.	53.	47.	42.
38.	34.	30.	27.	24.	22.	20.	20.	19.	19.
19.	19.								

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	616.	339.	113.	59.	11331.
CMS	17.	10.	3.	2.	321.
INCHES		2.37	3.17	3.30	3.30
MM		60.20	80.44	83.87	83.87
AC-FT		168.	225.	234.	234.

PLATE D-9

THOUS CU M			207.	277.	289.		289.		

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	2.
3.	4.	5.	7.	9.	11.	13.	15.	17.	19.
22.	25.	31.	41.	55.	65.	67.	65.	60.	53.
48.	43.	40.	36.	31.	25.	20.	15.	11.	9.
7.	6.	6.	5.	4.	4.	4.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	4.	6.	9.
12.	15.	17.	18.	19.	20.	21.	21.	22.	22.
22.	22.	22.	22.	23.	23.	23.	23.	23.	23.
25.	30.	41.	56.	71.	86.	97.	106.	112.	116.
119.	122.	124.	125.	127.	127.	128.	129.	129.	130.
130.	130.	131.	131.	136.	151.	183.	227.	274.	320.
363.	399.	431.	462.	494.	526.	556.	592.	686.	849.
1065.	1209.	1233.	1168.	1054.	913.	804.	724.	652.	578.
492.	401.	314.	239.	180.	139.	117.	105.	94.	84.
76.	68.	61.	54.	49.	44.	40.	39.	39.	38.
38.	38.								

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1233.	678.	226.	110.	22662.
CMS	35.	19.	6.	3.	642.
INCHES		4.74	6.33	6.60	6.60
MM		120.39	160.89	167.75	167.75
AC-FT		336.	449.	468.	468.
THOUS CU M		414.	554.	578.	578.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	2.	2.	2.	3.
5.	7.	9.	12.	15.	19.	22.	26.	30.	34.
38.	43.	54.	72.	96.	113.	118.	114.	105.	93.
83.	76.	69.	62.	53.	44.	34.	26.	20.	15.
12.	11.	10.	9.	8.	7.	6.	6.	5.	5.
5.	4.	4.	4.	4.	4.	5.	7.	10.	15.
21.	25.	29.	32.	34.	35.	37.	37.	38.	38.
39.	39.	39.	39.	40.	40.	40.	40.	40.	40.
43.	52.	71.	97.	125.	150.	170.	185.	195.	203.
209.	213.	217.	219.	221.	223.	224.	225.	226.	227.
228.	228.	229.	229.	238.	265.	321.	397.	479.	560.
635.	698.	754.	808.	865.	921.	973.	1037.	1201.	1487.
1864.	2116.	2157.	2044.	1844.	1597.	1408.	1266.	1140.	1011.
862.	701.	549.	419.	315.	243.	206.	184.	165.	148.
132.	119.	106.	95.	85.	76.	70.	69.	68.	67.
67.	67.								

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2157.	1186.	396.	207.	39668.
CMS	61.	34.	11.	6.	1123.
INCHES		8.29	11.08	11.56	11.56

PLATE D-10

MM		210.68	281.56	293.56	293.56
AC-FT		588.	786.	819.	819.
THOUS CU M		725.	969.	1011.	1011.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 5

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	1.	2.	2.	3.	3.	4.
7.	10.	13.	17.	22.	26.	31.	37.	42.	48.
54.	62.	77.	103.	137.	161.	169.	163.	150.	132.
119.	109.	99.	89.	76.	63.	49.	38.	28.	22.
17.	15.	14.	12.	11.	10.	9.	8.	7.	7.
7.	6.	6.	6.	6.	6.	7.	10.	15.	22.
30.	36.	42.	46.	49.	51.	52.	53.	54.	55.
55.	56.	56.	56.	56.	57.	57.	57.	57.	57.
61.	75.	102.	139.	178.	214.	243.	264.	279.	290.
299.	305.	310.	313.	316.	319.	320.	322.	323.	324.
325.	326.	326.	327.	340.	378.	458.	567.	685.	800.
907.	997.	1077.	1154.	1236.	1316.	1390.	1481.	1716.	2124.
2662.	3022.	3082.	2920.	2634.	2282.	2011.	1809.	1629.	1444.
1231.	1002.	785.	598.	450.	347.	294.	263.	236.	211.
189.	170.	152.	136.	122.	109.	99.	98.	97.	96.
96.	96.								

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3082.	1694.	566.	295.	56655.
CMS	87.	48.	16.	8.	1604.
INCHES		11.85	15.84	16.51	16.51
MM		300.98	402.22	419.37	419.37
AC-FT		840.	1123.	1171.	1171.
THOUS CU M		1036.	1385.	1444.	1444.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

RESERVOIR ROUTING OF HYDROGRAPHS THRU WINDMILLER DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
C00002	1	0	0	2	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-625.	-1

STAGE	625.00	625.70	626.20	626.70	627.20	627.70	628.70	629.70	630.70
FLOW	0.00	12.00	77.00	173.00	291.00	429.00	753.00	1140.00	1583.00
CAPACITY=	0.	215.	743.						
ELEVATION=	600.	624.	640.						

PLATE D-11

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
625.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
626.9	3.0	1.5	1055.

CREST LENGTH AT OR BELOW ELEVATION				
	0.	630.	1000.	1055.
	626.9	627.7	628.2	628.8

STATION 000002, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.	3.	4.	4.	4.
4.	5.	5.	5.	5.	6.	6.	6.	7.	7.
7.	7.	8.	8.	8.	9.	9.	9.	10.	11.
11.	15.	22.	29.	36.	43.	51.	58.	66.	76.
95.	117.	138.	157.	171.	181.	186.	186.	184.	180.
174.	167.	158.	147.	137.	125.	115.	105.	96.	87.
79.	74.	69.	65.	61.	57.	53.	50.	46.	44.
41.	38.								

STORAGE

257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	258.	258.
258.	258.	258.	258.	258.	259.	259.	259.	260.	260.
260.	260.	260.	261.	261.	261.	261.	261.	261.	261.
261.	261.	261.	261.	261.	261.	261.	261.	261.	261.
261.	261.	261.	261.	261.	261.	261.	261.	261.	261.
261.	261.	261.	261.	261.	261.	261.	261.	261.	261.
261.	261.	261.	261.	261.	262.	262.	262.	262.	262.
262.	262.	262.	262.	263.	263.	263.	264.	264.	265.
265.	266.	266.	267.	267.	268.	269.	269.	270.	270.
271.	271.	272.	272.	273.	273.	274.	275.	276.	277.
279.	280.	282.	284.	286.	288.	289.	291.	293.	296.
299.	303.	306.	309.	312.	313.	314.	314.	314.	313.
312.	311.	310.	308.	306.	304.	302.	301.	299.	298.
296.	295.	294.	293.	292.	291.	290.	289.	288.	288.
287.	286.								

STAGE

625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0

PLATE D-12

OVN

STATION 000002, PLAN 1, RATIO 5 (0.50 PMF)

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	2.	2.	3.
3.	4.	4.	5.	7.	8.	10.	12.	20.	30.
37.	44.	48.	52.	54.	56.	56.	55.	53.	51.
48.	46.	43.	41.	39.	36.	34.	32.	30.	28.
27.	25.	24.	22.	21.	20.	19.	18.	17.	17.
18.	19.	21.	23.	25.	27.	29.	31.	32.	34.
36.	37.	39.	40.	41.	43.	44.	45.	46.	47.
48.	49.	52.	58.	66.	76.	93.	112.	130.	148.
165.	182.	200.	216.	230.	244.	258.	271.	283.	293.
301.	307.	312.	316.	321.	332.	362.	423.	521.	646.
779.	902.	1005.	1094.	1179.	1264.	1344.	1429.	1591.	1921.
2426.	2898.	3078.	2990.	2744.	2423.	2123.	1900.	1716.	1540.
1349.	1144.	943.	764.	613.	496.	414.	360.	322.	294.
271.	252.	236.	223.	209.	196.	183.	172.	163.	156.
149.	143.								

STORAGE

257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
257.	257.	257.	257.	257.	257.	257.	257.	257.	257.
258.	258.	258.	258.	259.	259.	260.	260.	261.	262.
263.	264.	265.	267.	270.	273.	276.	279.	282.	284.
286.	288.	289.	290.	290.	291.	291.	290.	290.	289.
289.	288.	288.	287.	286.	286.	285.	285.	284.	284.
283.	283.	283.	282.	282.	282.	281.	281.	281.	281.
281.	282.	282.	282.	283.	283.	284.	284.	285.	285.
286.	286.	286.	287.	287.	287.	288.	288.	288.	288.
289.	289.	290.	291.	293.	296.	299.	302.	305.	308.
311.	313.	316.	318.	320.	322.	323.	324.	325.	326.
326.	327.	327.	327.	328.	328.	330.	332.	335.	339.
341.	344.	346.	347.	348.	349.	350.	351.	353.	356.
361.	365.	366.	365.	364.	361.	358.	356.	354.	352.
350.	348.	345.	341.	338.	335.	332.	330.	328.	326.
324.	322.	321.	319.	317.	315.	314.	312.	311.	309.
308.	307.								

STAGE

625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0	625.0
625.0	625.0	625.0	625.0	625.0	625.1	625.1	625.1	625.1	625.2
625.2	625.2	625.3	625.3	625.4	625.5	625.6	625.7	625.8	625.8
625.9	625.9	626.0	626.0	626.0	626.0	626.0	626.0	626.0	626.0
626.0	626.0	625.9	625.9	625.9	625.9	625.9	625.9	625.8	625.8
625.8	625.8	625.8	625.8	625.8	625.8	625.8	625.7	625.7	625.7
625.7	625.8	625.8	625.8	625.8	625.8	625.8	625.8	625.9	625.9

PLATE D-13

625.9	625.9	625.9	625.9	625.9	625.9	625.9	626.0	626.0	626.0
626.0	626.0	626.0	626.1	626.1	626.2	626.3	626.4	626.5	626.6
626.7	626.7	626.8	626.9	626.9	627.0	627.0	627.1	627.1	627.1
627.1	627.1	627.2	627.2	627.2	627.2	627.2	627.3	627.4	627.5
627.6	627.7	627.7	627.8	627.8	627.8	627.9	627.9	628.0	628.1
628.2	628.3	628.4	628.3	628.3	628.2	628.1	628.1	628.0	627.9
627.9	627.8	627.7	627.6	627.5	627.4	627.3	627.2	627.2	627.1
627.1	627.0	627.0	626.9	626.9	626.8	626.7	626.7	626.6	626.6
626.6	626.5								

PEAK OUTFLOW IS 3078. AT TIME 40.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3078.	1687.	553.	282.	54226.
CMS	87.	48.	16.	8.	1536.
INCHES		11.80	15.47	15.80	15.80
MM		299.69	393.06	401.39	401.39
AC-FT		837.	1097.	1120.	1120.
THOUS CU M		1032.	1353.	1382.	1382.

PLATE D-14

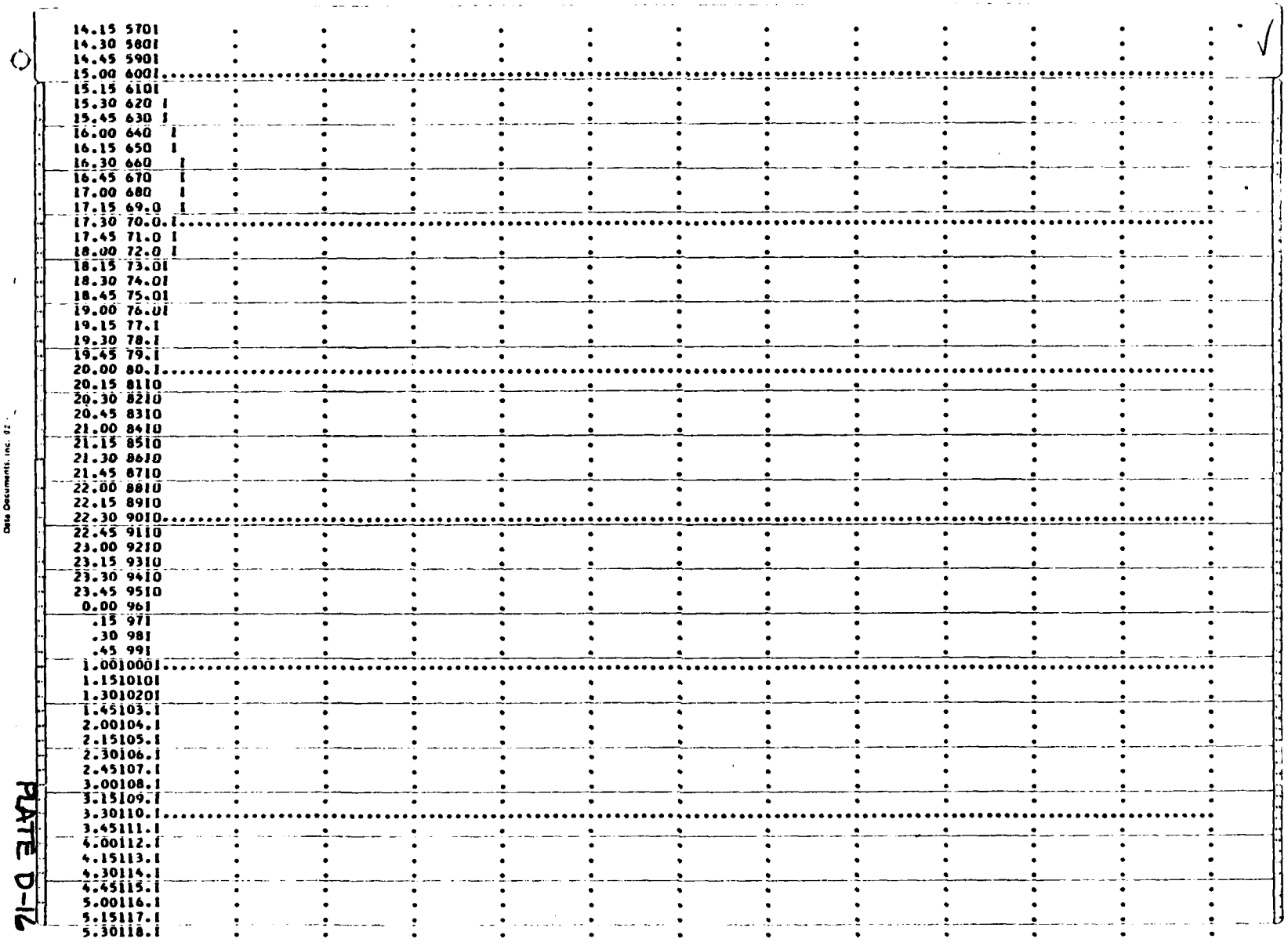
DVF

STATION000002

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

		0.	400.	800.	1200.	1600.	2000.	2400.	2800.	3200.	0.	0.	0.	0.
.15	11													
.30	21													
.45	31													
1.00	41													
1.15	51													
1.30	61													
1.45	71													
2.00	81													
2.15	91													
2.30	101													
2.45	111													
3.00	121													
3.15	131													
3.30	141													
3.45	151													
4.00	161													
4.15	171													
4.30	181													
4.45	191													
5.00	201													
5.15	211													
5.30	221													
5.45	231													
6.00	241													
6.15	251													
6.30	261													
6.45	271													
7.00	281													
7.15	291													
7.30	301													
7.45	311													
8.00	321													
8.15	331													
8.30	341													
8.45	351													
9.00	361													
9.15	371													
9.30	381													
9.45	391													
10.00	401													
10.15	411													
10.30	421													
10.45	431													
11.00	441													
11.15	451													
11.30	461													
11.45	471													
12.00	481													
12.15	491													
12.30	501													
12.45	511													
13.00	521													
13.15	531													
13.30	541													
13.45	5501													
14.00	5601													

PLATE D-15


14.15 5701
14.30 5801
14.45 5901
15.00 6001
15.15 6101
15.30 620 I
15.45 630 I
16.00 640 I
16.15 650 I
16.30 660 I
16.45 670 I
17.00 680 I
17.15 69.0 I
17.30 70.0 I
17.45 71.0 I
18.00 72.0 I
18.15 73.01
18.30 74.01
18.45 75.01
19.00 76.01
19.15 77.1
19.30 78.1
19.45 79.1
20.00 80.1
20.15 8110
20.30 8210
20.45 8310
21.00 8410
21.15 8510
21.30 8610
21.45 8710
22.00 8810
22.15 8910
22.30 9010
22.45 9110
23.00 9210
23.15 9310
23.30 9410
23.45 9510
0.00 961
.15 971
.30 981
.45 991
1.0010001
1.1510101
1.3010201
1.45103.1
2.00104.1
2.15105.1
2.30106.1
2.45107.1
3.00108.1
3.15109.1
3.30110.1
3.45111.1
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4.30114.1
4.45115.1
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5.15117.1
5.30118.1

PLATE D-12

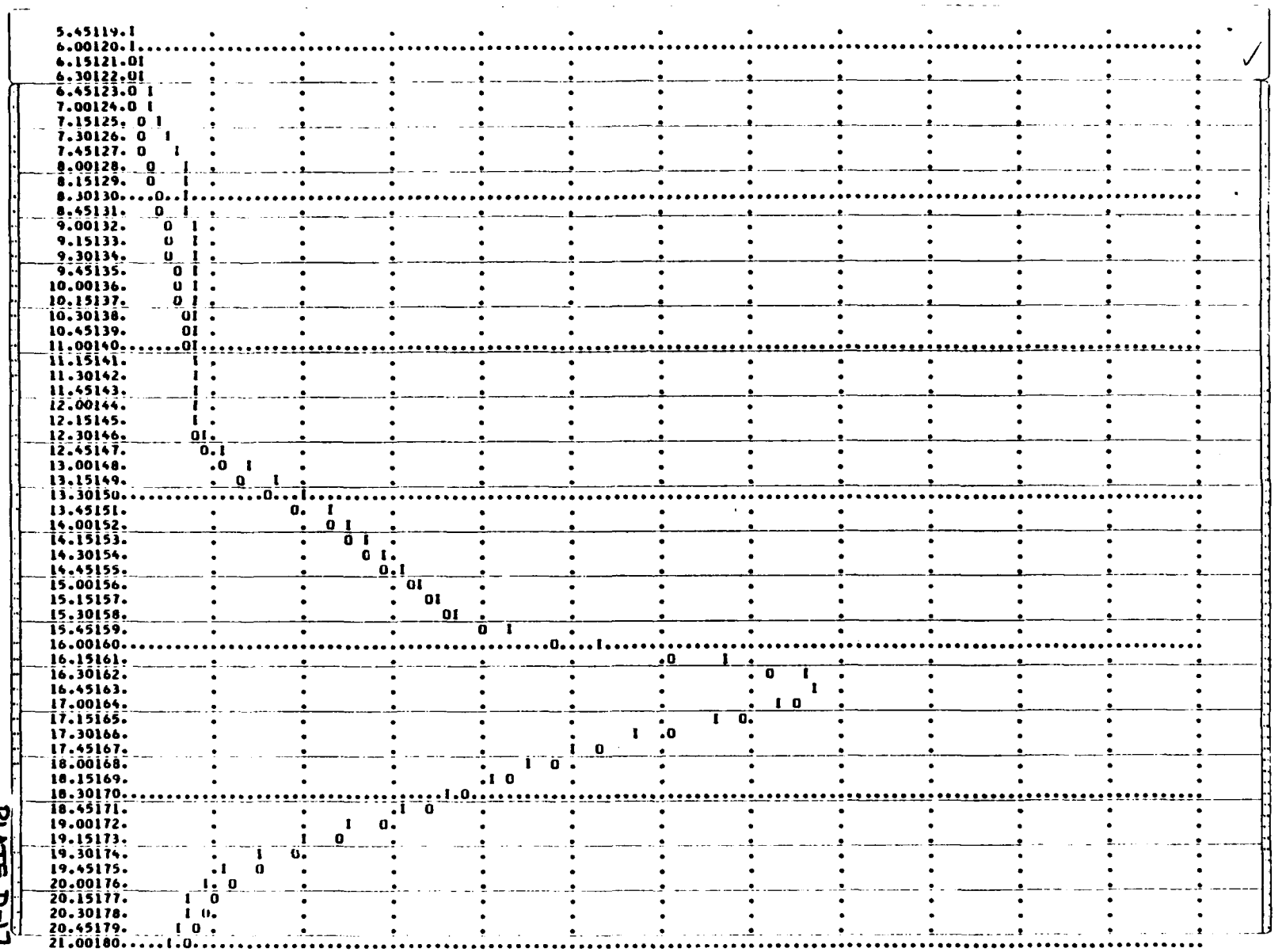

PLATE D-17

PLATE D-18

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .05	RATIO 2 .10	RATIO 3 .20	RATIO 4 .35	RATIO 5 .50
HYDROGRAPH AT	000001	1.33	1	308.	616.	1233.	2157.	3082.
		(3.44)	(	8.73)(	17.45)(	34.90)(	61.08)(	87.26)(
ROUTED TO	000002	1.33	1	186.	541.	1200.	2144.	3078.
		(3.44)	(	5.28)(	15.31)(	33.98)(	60.72)(	87.15)(

PLATE D-19

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	625.00	625.00	626.90
STORAGE	257.	257.	319.
OUTFLOW	0.	0.	220.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.05	626.76	0.00	314.	186.	0.00	42.00	0.00
.10	627.43	.53	336.	541.	3.75	41.25	0.00
.20	627.82	.92	348.	1200.	6.50	41.00	0.00
.35	628.13	1.23	359.	2144.	8.75	40.75	0.00
.50	628.36	1.46	366.	3078.	12.50	40.75	0.00

PLATE D-20

```
A1       MISSOURI DAM SAFETY INSPECTION
A2       WINDMILLER DAM NO 10035
A3       RESERVOIR ROUTING OF 10 YR FLOOD MAIN DAM ONLY
B 000144000000000000010                                              00000003
B1000003
K 00000000000001                  000000020000000000000001
K1       CALCULATION OF 10 YR HYDROGRAPH
M 000000000000200001.33           00000000000001.0
O 000144
0100.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.009
0100.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.009
0100.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.009
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0100.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.0090000.009
0100.0090000.0090000.0090000.009
T                                                          -1.     -75.
W2          1.08
X           -.10       3.
K 000001000000002                 000000020000000000000001
K1       ROUTING OF 10 YR HYDROGRAPH
Y                            00000001
Y1     1                                              -625.0       -1
Y4 625.0    625.7    626.2    626.7    627.2    627.7    628.7    629.7    630.7
Y5    0.      12.      77.     173.     291.     429.     753.    1140.    1583.
$S    0.     215.     743.
$E  600.    623.7    640.
$$ 625.0
$D 626.9     3.0      1.5    1055.
$L00000.0000630.0001000.0001055.
$V 626.9   627.7    628.2    628.8
K 000099
A
A
A
A
A
```

PLATE D-21

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE= 79/08/20.
TIME= 13.07.28.

MISSOURI DAM SAFETY INSPECTION
WINDMILLER DAM NO 10035
RESERVOIR ROUTING OF 10 YR FLOOD MAIN DAM ONLY

JOB SPECIFICATION

NO	NMIN	MIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
144	0	10	0	0	0	0	0	3	0

JOPER	NMT	LROPT	TRACE
3	0	0	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

CALCULATION OF 10 YR HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
000001	0	0	0	2	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	2	1.33	0.00	1.33	1.00	0.000	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
144	0.00	0.00	0.00

PRECIP PATTERN

.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.02
.02	.02	.02	.02	.02	.02	.02	.02	.02	.02
.02	.02	.02	.02	.03	.03	.03	.03	.03	.03
.03	.03	.03	.06	.06	.06	.12	.12	.12	.16
.16	.41	.96	.30	.16	.12	.12	.12	.06	.06
.06	.03	.03	.03	.03	.03	.03	.03	.03	.03
.02	.02	.02	.02	.02	.02	.02	.02	.02	.02
.02	.02	.02	.02	.02	.02	.02	.02	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01						

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-75.00	0.00	0.00

CURVE NO = -75.00 WETNESS = -1.00 EFFECT CN = 75.00

PLATE D-22

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= 1.08

RECESSION DATA
STRTQ= 0.00 QRCSN= -.10 RTIOR= 3.00

UNIT HYDROGRAPH 34 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= 1.08 VOL= 1.00

33.	98.	198.	336.	463.	533.	552.	531.	479.	413.
325.	247.	195.	153.	125.	99.	77.	61.	49.	39.
30.	24.	19.	15.	12.	10.	8.	6.	5.	4.
3.	2.	2.	1.						

Q END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.10	1	.01	0.00	.01	0.	1.01	12.10	73	.96	.59	.37	150.
1.01	.20	2	.01	0.00	.01	0.	1.01	12.20	74	.30	.21	.09	231.
1.01	.30	3	.01	0.00	.01	0.	1.01	12.30	75	.16	.11	.05	343.
1.01	.40	4	.01	0.00	.01	0.	1.01	12.40	76	.12	.09	.03	479.
1.01	.50	5	.01	0.00	.01	0.	1.01	12.50	77	.12	.09	.03	607.
1.01	1.00	6	.01	0.00	.01	0.	1.01	13.00	78	.12	.09	.03	697.
1.01	1.10	7	.01	0.00	.01	0.	1.01	13.10	79	.06	.04	.01	744.
1.01	1.20	8	.01	0.00	.01	0.	1.01	13.20	80	.06	.04	.01	752.
1.01	1.30	9	.01	0.00	.01	0.	1.01	13.30	81	.06	.04	.01	727.
1.01	1.40	10	.01	0.00	.01	0.	1.01	13.40	82	.03	.02	.01	678.
1.01	1.50	11	.01	0.00	.01	0.	1.01	13.50	83	.03	.02	.01	606.
1.01	2.00	12	.01	0.00	.01	0.	1.01	14.00	84	.03	.02	.01	530.
1.01	2.10	13	.01	0.00	.01	0.	1.01	14.10	85	.03	.02	.01	465.
1.01	2.20	14	.01	0.00	.01	0.	1.01	14.20	86	.03	.02	.01	406.
1.01	2.30	15	.01	0.00	.01	0.	1.01	14.30	87	.03	.02	.01	355.
1.01	2.40	16	.01	0.00	.01	0.	1.01	14.40	88	.03	.02	.01	309.
1.01	2.50	17	.01	0.00	.01	0.	1.01	14.50	89	.03	.02	.01	270.
1.01	3.00	18	.01	0.00	.01	0.	1.01	15.00	90	.03	.02	.01	240.
1.01	3.10	19	.01	0.00	.01	0.	1.01	15.10	91	.02	.02	.00	214.
1.01	3.20	20	.01	0.00	.01	0.	1.01	15.20	92	.02	.02	.00	194.
1.01	3.30	21	.01	0.00	.01	0.	1.01	15.30	93	.02	.02	.00	177.
1.01	3.40	22	.01	0.00	.01	0.	1.01	15.40	94	.02	.02	.00	162.
1.01	3.50	23	.01	0.00	.01	0.	1.01	15.50	95	.02	.02	.00	149.
1.01	4.00	24	.01	0.00	.01	0.	1.01	16.00	96	.02	.02	.00	138.
1.01	4.10	25	.01	0.00	.01	0.	1.01	16.10	97	.02	.02	.00	128.
1.01	4.20	26	.01	0.00	.01	0.	1.01	16.20	98	.02	.02	.00	120.
1.01	4.30	27	.01	0.00	.01	0.	1.01	16.30	99	.02	.02	.00	113.
1.01	4.40	28	.01	0.00	.01	0.	1.01	16.40	100	.02	.02	.00	107.
1.01	4.50	29	.01	0.00	.01	0.	1.01	16.50	101	.02	.02	.00	102.
1.01	5.00	30	.01	0.00	.01	0.	1.01	17.00	102	.02	.02	.00	99.
1.01	5.10	31	.01	0.00	.01	0.	1.01	17.10	103	.02	.02	.00	96.
1.01	5.20	32	.01	0.00	.01	0.	1.01	17.20	104	.02	.02	.00	94.
1.01	5.30	33	.01	0.00	.01	0.	1.01	17.30	105	.02	.02	.00	92.
1.01	5.40	34	.01	0.00	.01	0.	1.01	17.40	106	.02	.02	.00	90.
1.01	5.50	35	.01	0.00	.01	0.	1.01	17.50	107	.02	.02	.00	89.
1.01	6.00	36	.01	0.00	.01	0.	1.01	18.00	108	.02	.02	.00	88.
1.01	6.10	37	.02	0.00	.02	0.	1.01	18.10	109	.01	.01	.00	87.
1.01	6.20	38	.02	0.00	.02	0.	1.01	18.20	110	.01	.01	.00	86.
1.01	6.30	39	.02	0.00	.02	0.	1.01	18.30	111	.01	.01	.00	84.
1.01	6.40	40	.02	0.00	.02	0.	1.01	18.40	112	.01	.01	.00	80.
1.01	6.50	41	.02	0.00	.02	0.	1.01	18.50	113	.01	.01	.00	76.
1.01	7.00	42	.02	0.00	.02	0.	1.01	19.00	114	.01	.01	.00	71.
1.01	7.10	43	.02	0.00	.02	0.	1.01	19.10	115	.01	.01	.00	65.
1.01	7.20	44	.02	0.00	.02	0.	1.01	19.20	116	.01	.01	.00	60.
1.01	7.30	45	.02	0.00	.02	0.	1.01	19.30	117	.01	.01	.00	56.
1.01	7.40	46	.02	0.00	.02	0.	1.01	19.40	118	.01	.01	.00	52.
1.01	7.50	47	.02	0.00	.02	0.	1.01	19.50	119	.01	.01	.00	49.

PLATE D-23

1.01	8.00	48	.02	0.00	.02	0.	1.01	20.00	120	.01	.01	.00	46.
1.01	8.10	49	.02	0.00	.02	0.	1.01	20.10	121	.01	.01	.00	44.
1.01	8.20	50	.02	0.00	.02	0.	1.01	20.20	122	.01	.01	.00	43.
1.01	8.30	51	.02	0.00	.02	0.	1.01	20.30	123	.01	.01	.00	42.
1.01	8.40	52	.02	0.00	.02	0.	1.01	20.40	124	.01	.01	.00	41.
1.01	8.50	53	.02	.00	.02	0.	1.01	20.50	125	.01	.01	.00	40.
1.01	9.00	54	.02	.00	.02	0.	1.01	21.00	126	.01	.01	.00	40.
1.01	9.10	55	.03	.00	.03	0.	1.01	21.10	127	.01	.01	.00	39.
1.01	9.20	56	.03	.00	.03	0.	1.01	21.20	128	.01	.01	.00	39.
1.01	9.30	57	.03	.00	.03	1.	1.01	21.30	129	.01	.01	.00	38.
1.01	9.40	58	.03	.00	.03	1.	1.01	21.40	130	.01	.01	.00	38.
1.01	9.50	59	.03	.00	.03	2.	1.01	21.50	131	.01	.01	.00	38.
1.01	10.00	60	.03	.00	.03	3.	1.01	22.00	132	.01	.01	.00	38.
1.01	10.10	61	.03	.00	.03	4.	1.01	22.10	133	.01	.01	.00	38.
1.01	10.20	62	.03	.00	.03	6.	1.01	22.20	134	.01	.01	.00	38.
1.01	10.30	63	.03	.00	.03	7.	1.01	22.30	135	.01	.01	.00	38.
1.01	10.40	64	.06	.01	.05	9.	1.01	22.40	136	.01	.01	.00	38.
1.01	10.50	65	.06	.01	.05	12.	1.01	22.50	137	.01	.01	.00	38.
1.01	11.00	66	.06	.01	.05	15.	1.01	23.00	138	.01	.01	.00	38.
1.01	11.10	67	.12	.03	.09	20.	1.01	23.10	139	.01	.01	.00	38.
1.01	11.20	68	.12	.04	.08	27.	1.01	23.20	140	.01	.01	.00	38.
1.01	11.30	69	.12	.04	.08	36.	1.01	23.30	141	.01	.01	.00	38.
1.01	11.40	70	.16	.06	.10	50.	1.01	23.40	142	.01	.01	.00	38.
1.01	11.50	71	.16	.07	.09	69.	1.01	23.50	143	.01	.01	.00	38.
1.01	12.00	72	.41	.20	.21	96.	1.02	0.00	144	.01	.01	.00	38.
									SUM	5.15	2.57	2.58	12947.
										(131.1(	65.1(	66.1(	366.62)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	752.	301.	90.	90.	12922.
CMS	21.	9.	3.	3.	366.
INCHES		2.11	2.51	2.51	2.51
MM		53.51	63.77	63.77	63.77
AC-FT		149.	178.	178.	178.
THOUS CU M		184.	220.	220.	220.

PLATE D-24

DVN

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTING OF 10 YR HYDROGRAPH

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
000002	1	0	0	2	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-625.	-1

STAGE	625.00	625.70	626.20	626.70	627.20	627.70	628.70	629.70	630.70
FLOW	0.00	12.00	77.00	173.00	291.00	429.00	753.00	1140.00	1583.00
CAPACITY=	0.	218.	743.						
ELEVATION=	600.	624.	640.						

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
625.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
626.9	3.0	1.5	1055.

CREST LENGTH	0.	630.	1000.	1055.	
AT OR BELOW ELEVATION	626.9	627.7	628.2	628.8	

END-OF-PERIOD HYDROGRAPH ORDINATES

NO.DA	HR.MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1.01	.10	1	.17	0.	0.	257.	625.0
1.01	.20	2	.33	0.	0.	257.	625.0
1.01	.30	3	.50	0.	0.	257.	625.0
1.01	.40	4	.67	0.	0.	257.	625.0
1.01	.50	5	.83	0.	0.	257.	625.0
1.01	1.00	6	1.00	0.	0.	257.	625.0
1.01	1.10	7	1.17	0.	0.	257.	625.0
1.01	1.20	8	1.33	0.	0.	257.	625.0
1.01	1.30	9	1.50	0.	0.	257.	625.0
1.01	1.40	10	1.67	0.	0.	257.	625.0
1.01	1.50	11	1.83	0.	0.	257.	625.0
1.01	2.00	12	2.00	0.	0.	257.	625.0
1.01	2.10	13	2.17	0.	0.	257.	625.0
1.01	2.20	14	2.33	0.	0.	257.	625.0
1.01	2.30	15	2.50	0.	0.	257.	625.0
1.01	2.40	16	2.67	0.	0.	257.	625.0
1.01	2.50	17	2.83	0.	0.	257.	625.0
1.01	3.00	18	3.00	0.	0.	257.	625.0
1.01	3.10	19	3.17	0.	0.	257.	625.0
1.01	3.20	20	3.33	0.	0.	257.	625.0
1.01	3.30	21	3.50	0.	0.	257.	625.0

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1.01	3.40	22	3.67	0.	0.	257.	625.0
1.01	3.50	23	3.83	0.	0.	257.	625.0
1.01	4.00	24	4.00	0.	0.	257.	625.0
1.01	4.10	25	4.17	0.	0.	257.	625.0
1.01	4.20	26	4.33	0.	0.	257.	625.0
1.01	4.30	27	4.50	0.	0.	257.	625.0
1.01	4.40	28	4.67	0.	0.	257.	625.0
1.01	4.50	29	4.83	0.	0.	257.	625.0
1.01	5.00	30	5.00	0.	0.	257.	625.0
1.01	5.10	31	5.17	0.	0.	257.	625.0
1.01	5.20	32	5.33	0.	0.	257.	625.0
1.01	5.30	33	5.50	0.	0.	257.	625.0
1.01	5.40	34	5.67	0.	0.	257.	625.0
1.01	5.50	35	5.83	0.	0.	257.	625.0
1.01	6.00	36	6.00	0.	0.	257.	625.0
1.01	6.10	37	6.17	0.	0.	257.	625.0
1.01	6.20	38	6.33	0.	0.	257.	625.0
1.01	6.30	39	6.50	0.	0.	257.	625.0
1.01	6.40	40	6.67	0.	0.	257.	625.0
1.01	6.50	41	6.83	0.	0.	257.	625.0
1.01	7.00	42	7.00	0.	0.	257.	625.0
1.01	7.10	43	7.17	0.	0.	257.	625.0
1.01	7.20	44	7.33	0.	0.	257.	625.0
1.01	7.30	45	7.50	0.	0.	257.	625.0
1.01	7.40	46	7.67	0.	0.	257.	625.0
1.01	7.50	47	7.83	0.	0.	257.	625.0
1.01	8.00	48	8.00	0.	0.	257.	625.0
1.01	8.10	49	8.17	0.	0.	257.	625.0
1.01	8.20	50	8.33	0.	0.	257.	625.0
1.01	8.30	51	8.50	0.	0.	257.	625.0
1.01	8.40	52	8.67	0.	0.	257.	625.0
1.01	8.50	53	8.83	0.	0.	257.	625.0
1.01	9.00	54	9.00	0.	0.	257.	625.0
1.01	9.10	55	9.17	0.	0.	257.	625.0
1.01	9.20	56	9.33	0.	0.	257.	625.0
1.01	9.30	57	9.50	1.	0.	257.	625.0
1.01	9.40	58	9.67	1.	0.	257.	625.0
1.01	9.50	59	9.83	2.	0.	257.	625.0
1.01	10.00	60	10.00	3.	0.	257.	625.0
1.01	10.10	61	10.17	4.	0.	257.	625.0
1.01	10.20	62	10.33	6.	0.	257.	625.0
1.01	10.30	63	10.50	7.	0.	257.	625.0
1.01	10.40	64	10.67	9.	0.	257.	625.0
1.01	10.50	65	10.83	12.	0.	258.	625.0
1.01	11.00	66	11.00	15.	0.	258.	625.0
1.01	11.10	67	11.17	20.	0.	258.	625.0
1.01	11.20	68	11.33	27.	1.	258.	625.0
1.01	11.30	69	11.50	36.	1.	259.	625.1
1.01	11.40	70	11.67	50.	1.	259.	625.1
1.01	11.50	71	11.83	69.	2.	260.	625.1
1.01	12.00	72	12.00	96.	2.	261.	625.1
1.01	12.10	73	12.17	150.	3.	263.	625.2
1.01	12.20	74	12.33	231.	4.	265.	625.3
1.01	12.30	75	12.50	343.	6.	269.	625.4
1.01	12.40	76	12.67	479.	9.	275.	625.6
1.01	12.50	77	12.83	607.	22.	282.	625.8
1.01	13.00	78	13.00	697.	56.	291.	626.0
1.01	13.10	79	13.17	744.	98.	299.	626.3
1.01	13.20	80	13.33	752.	149.	308.	626.6
1.01	13.30	81	13.50	727.	200.	316.	626.8
1.01	13.40	82	13.67	678.	252.	322.	627.0
1.01	13.50	83	13.83	606.	317.	327.	627.2

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1.01	14.00	84	14.00	530.	379.	330.	627.3
1.01	14.10	85	14.17	465.	414.	332.	627.3
1.01	14.20	86	14.33	406.	420.	332.	627.3
1.01	14.30	87	14.50	355.	409.	332.	627.3
1.01	14.40	88	14.67	309.	387.	331.	627.3
1.01	14.50	89	14.83	270.	360.	330.	627.2
1.01	15.00	90	15.00	240.	334.	328.	627.2
1.01	15.10	91	15.17	214.	311.	327.	627.2
1.01	15.20	92	15.33	194.	291.	326.	627.1
1.01	15.30	93	15.50	177.	273.	324.	627.1
1.01	15.40	94	15.67	162.	258.	323.	627.0
1.01	15.50	95	15.83	149.	245.	322.	627.0
1.01	16.00	96	16.00	138.	233.	320.	627.0
1.01	16.10	97	16.17	128.	223.	319.	626.9
1.01	16.20	98	16.33	120.	214.	318.	626.9
1.01	16.30	99	16.50	113.	204.	316.	626.8
1.01	16.40	100	16.67	107.	195.	315.	626.8
1.01	16.50	101	16.83	102.	187.	314.	626.8
1.01	17.00	102	17.00	99.	179.	313.	626.7
1.01	17.10	103	17.17	96.	171.	312.	626.7
1.01	17.20	104	17.33	94.	166.	311.	626.7
1.01	17.30	105	17.50	92.	160.	310.	626.6
1.01	17.40	106	17.67	90.	154.	309.	626.6
1.01	17.50	107	17.83	89.	149.	308.	626.6
1.01	18.00	108	18.00	88.	145.	307.	626.6
1.01	18.10	109	18.17	87.	140.	307.	626.5
1.01	18.20	110	18.33	86.	136.	306.	626.5
1.01	18.30	111	18.50	84.	132.	305.	626.5
1.01	18.40	112	18.67	80.	128.	305.	626.5
1.01	18.50	113	18.83	76.	124.	304.	626.4
1.01	19.00	114	19.00	71.	120.	303.	626.4
1.01	19.10	115	19.17	65.	116.	303.	626.4
1.01	19.20	116	19.33	60.	112.	302.	626.4
1.01	19.30	117	19.50	56.	108.	301.	626.4
1.01	19.40	118	19.67	52.	103.	300.	626.3
1.01	19.50	119	19.83	49.	99.	300.	626.3
1.01	20.00	120	20.00	46.	95.	299.	626.3
1.01	20.10	121	20.17	44.	91.	298.	626.3
1.01	20.20	122	20.33	43.	88.	298.	626.3
1.01	20.30	123	20.50	42.	84.	297.	626.2
1.01	20.40	124	20.67	41.	81.	297.	626.2
1.01	20.50	125	20.83	40.	78.	296.	626.2
1.01	21.00	126	21.00	40.	75.	296.	626.2
1.01	21.10	127	21.17	39.	73.	295.	626.2
1.01	21.20	128	21.33	39.	72.	295.	626.2
1.01	21.30	129	21.50	38.	70.	294.	626.1
1.01	21.40	130	21.67	38.	68.	294.	626.1
1.01	21.50	131	21.83	38.	66.	293.	626.1
1.01	22.00	132	22.00	38.	65.	293.	626.1
1.01	22.10	133	22.17	38.	64.	293.	626.1
1.01	22.20	134	22.33	38.	62.	292.	626.1
1.01	22.30	135	22.50	38.	61.	292.	626.1
1.01	22.40	136	22.67	38.	60.	292.	626.1
1.01	22.50	137	22.83	38.	58.	291.	626.1
1.01	23.00	138	23.00	38.	57.	291.	626.0
1.01	23.10	139	23.17	38.	56.	291.	626.0
1.01	23.20	140	23.33	38.	55.	291.	626.0
1.01	23.30	141	23.50	38.	54.	290.	626.0
1.01	23.40	142	23.67	38.	53.	290.	626.0
1.01	23.50	143	23.83	38.	53.	290.	626.0
1.02	0.00	144	24.00	38.	52.	290.	626.0

PLATE B-27

PEAK OUTFLOW IS 420. AT TIME 14.33 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	420.	230.	73.	73.	10571.
CMS	12.	7.	2.	2.	299.
INCHES		1.41	2.05	2.05	2.05
MM		40.80	52.16	52.16	52.16
AC-FT		114.	146.	146.	146.
THOUS CU M		140.	180.	180.	180.

PLATE D-28

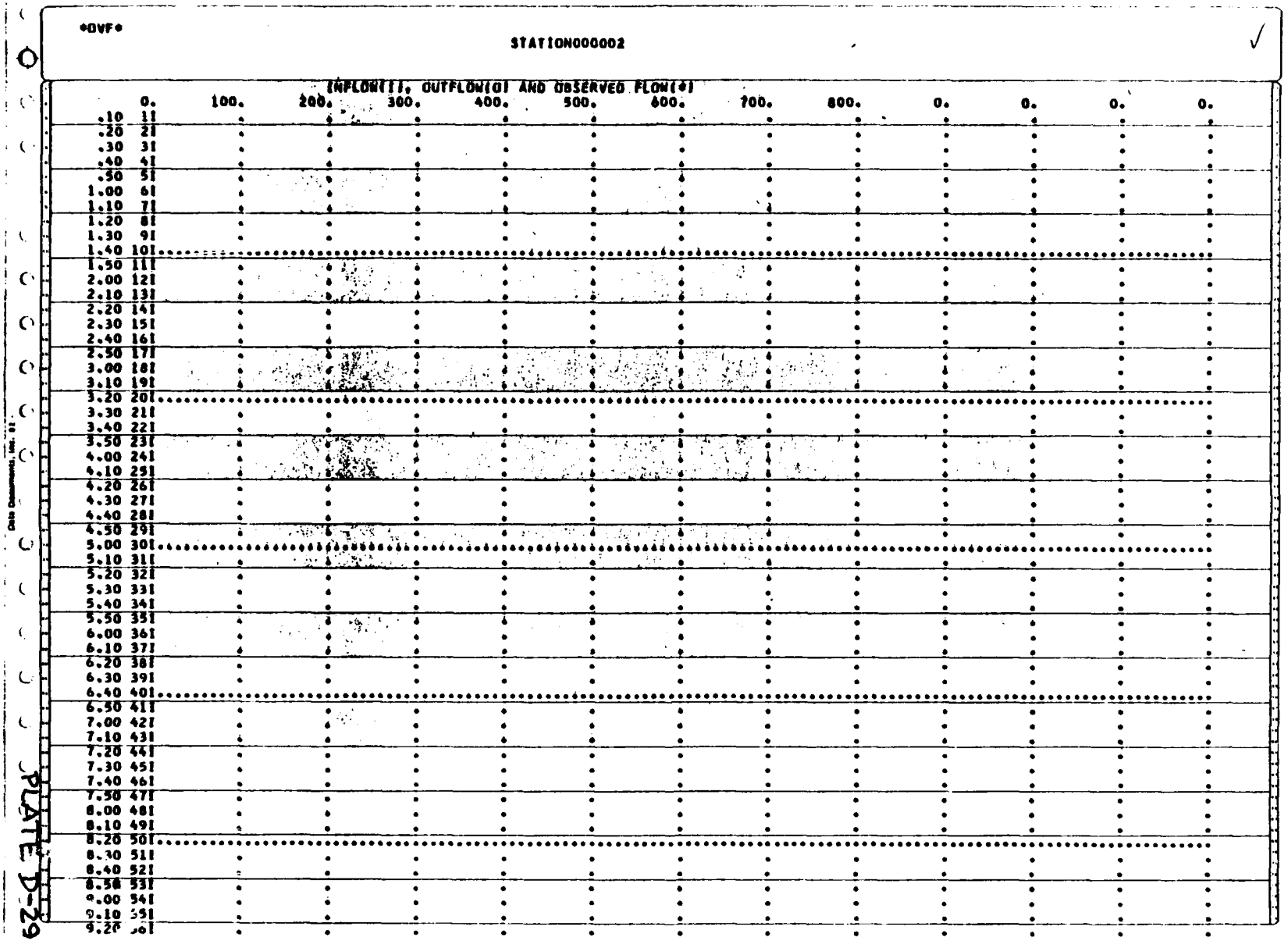

OVF
STATION000002
(INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 100. 200. 300. 400. 500. 600. 700. 800. 0. 0. 0. 0.
.10 11
.20 21
.30 31
.40 41
.50 51
1.00 61
1.10 71
1.20 81
1.30 91
1.40 101
1.50 111
2.00 121
2.10 131
2.20 141
2.30 151
2.40 161
2.50 171
3.00 181
3.10 191
3.20 201
3.30 211
3.40 221
3.50 231
4.00 241
4.10 251
4.20 261
4.30 271
4.40 281
4.50 291
5.00 301
5.10 311
5.20 321
5.30 331
5.40 341
5.50 351
6.00 361
6.10 371
6.20 381
6.30 391
6.40 401
6.50 411
7.00 421
7.10 431
7.20 441
7.30 451
7.40 461
7.50 471
8.00 481
8.10 491
8.20 501
8.30 511
8.40 521
8.50 531
9.00 541
9.10 551
9.20 561

PLATE D-29

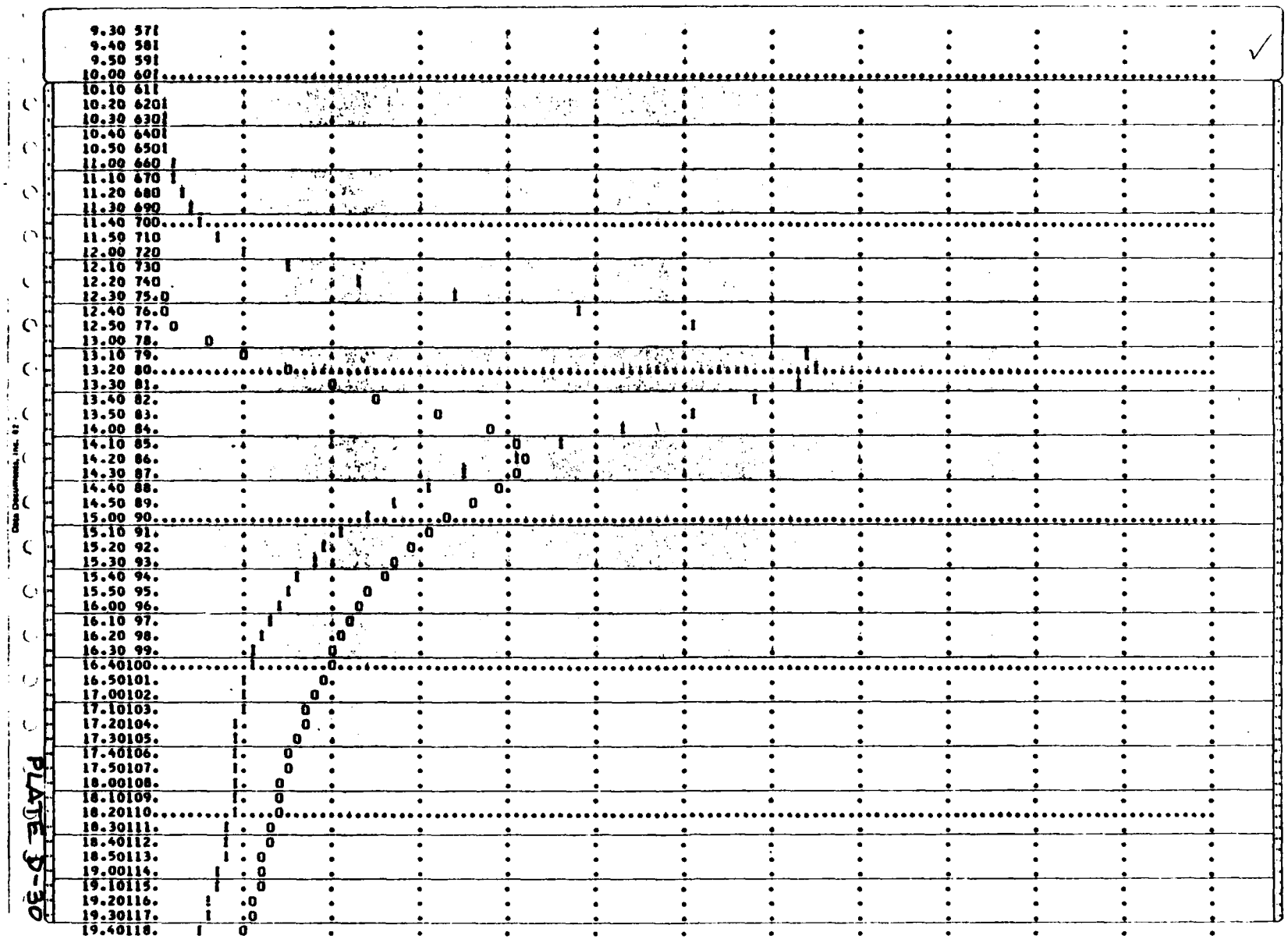

9.30 571
9.40 581
9.50 591
10.00 601
10.10 611
10.20 6201
10.30 6301
10.40 6401
10.50 6501
11.00 660
11.10 670
11.20 680
11.30 690
11.40 700
11.50 710
12.00 720
12.10 730
12.20 740
12.30 75.0
12.40 76.0
12.50 77. 0
13.00 78. 0
13.10 79. 0
13.20 80.
13.30 81.
13.40 82.
13.50 83.
14.00 84.
14.10 85.
14.20 86.
14.30 87.
14.40 88.
14.50 89.
15.00 90.
15.10 91.
15.20 92.
15.30 93.
15.40 94.
15.50 95.
16.00 96.
16.10 97.
16.20 98.
16.30 99.
16.40100.
16.50101.
17.00102.
17.10103.
17.20104.
17.30105.
17.40106.
17.50107.
18.00108.
18.10109.
18.20110.
18.30111.
18.40112.
18.50113.
19.00114.
19.10115.
19.20116.
19.30117.
19.40118.

PLATE 3-30

```
19.50119.    1    0
20.00120.....1....0.....
20.10121.    1     0.
20.20122.    1     0.
20.30123.    1   0
20.40124.    1   0
20.50125.    1   0
21.00126.    1   0
21.10127.    1  0
21.20128.    1  0
21.30129.    1  0
21.40130.....1..0.....
21.50131.    1  0
22.00132.    1 0
22.10133.    1 0
22.20134.    1 0
22.30135.    1 0
22.40136.    1 0
22.50137.    1 0
23.00138.    1 0
23.10139.    1 0
23.20140.....1.0.....
23.30141.    10
23.40142.    10
23.50143.    10
 0.00144.    10
```

PLATE D-31

RUNOFF SUMMARY, AVERAGE FLOW IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES(SQUARE KILOMETERS)

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	000001	752.	301.	90.	90.	1.33
		(21.28)(	8.53)(	2.54)(	2.54)(	3.44)
ROUTED TO	000002	420.	230.	73.	73.	1.33
		(11.91)(	6.50)(	2.08)(	2.08)(	3.44)

PLATE D-32

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ..... ✓

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	625.00	625.00	626.90
STORAGE	257.	257.	319.
OUTFLOW	0.	0.	220.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.00	627.31	.41	332.	420.	2.67	14.33	0.00

PLATE D-33

```
A1       MISSOURI DAM SAFETY INSPECTIONS
A2       WINDMILLER DAM MO 10035
A3       RATIOS OF PMF-SMALL DAM ONLY                                    00000003
B 000288000000000000000005
B1000005
J 000001000000050000000001
J1000.0500000.1000000.2000000.3500000.50
K 00000000000001                         0C000002         00000001
K1       HYDROGRAPHS FOR RATIOS OF PMF
M 0000010000000200000.24                                 1.0              00000001
P        000024.80000102.0000121.0C00130.                      -1.     -88.
T
W2           0.35
X      0.    -.10        3.
K 00000100000002                         0000C002         00000001
K1       RESERVOIR ROUTING OF RATICS OF PMF
Y                           000000001000CC001                  -627.7      -1
Y1     1
Y4 627.7      635.
Y500000.0000000.
$S     0.      45.      133.
$E  605.    623.7     640.
$$ 627.7
$D 627.7       3.0       1.5      640.
$L00005.0000010.0000230.0000350.0000640.
$V 627.7     627.9     627.9     628.8     629.7
K 000099
A
A
A
A
A
```

PLATE D-34

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE= 79/08/20.
TIME= 13.07.00.

MISSOURI DAM SAFETY INSPECTIONS
WINDMILLER DAM MO 10035
RATIOS OF PMF-SMALL DAM ONLY

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
288	0	5	0	0	0	0	0	3	0

JUPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 5 LRTIO= 1
RTIOS= .05 .10 .20 .35 .50

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

HYDROGRAPHS FOR RATIOS OF PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
C00001	0	0	0	2	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOM	ISAME	LOCAL
1	2	.24	0.00	.24	1.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.80	102.00	121.00	130.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-88.00	0.00	0.00

CURVE NO = -88.00 WETNESS = -1.00 EFFECT CN = 88.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .35

RECESSION DATA
STRTQ= 0.00 QRCSN= -.10 RTIOR= 3.00

UNIT HYDROGRAPH 23 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .35 VOL= 1.00

33.	104.	214.	284.	294.	260.	205.	136.	96.	69.
49.	34.	24.	17.	12.	9.	6.	4.	3.	2.
2.	1.	0.							

PLATE D-35

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	END-OF-PERIOD FLOW COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.05	1	.01	0.00	.01	0.	1.01	12.05	145	.21	.20	.01	121.
1.01	.10	2	.01	0.00	.01	0.	1.01	12.10	146	.21	.20	.01	135.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.15	147	.21	.20	.01	165.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.20	148	.21	.20	.01	205.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.25	149	.21	.20	.01	247.
1.01	.30	6	.01	0.00	.01	0.	1.01	12.30	150	.21	.20	.01	283.
1.01	.35	7	.01	0.00	.01	0.	1.01	12.35	151	.21	.20	.01	312.
1.01	.40	8	.01	0.00	.01	0.	1.01	12.40	152	.21	.21	.01	332.
1.01	.45	9	.01	0.00	.01	0.	1.01	12.45	153	.21	.21	.01	346.
1.01	.50	10	.01	0.00	.01	0.	1.01	12.50	154	.21	.21	.01	356.
1.01	.55	11	.01	0.00	.01	0.	1.01	12.55	155	.21	.21	.00	364.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.00	156	.21	.21	.00	369.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.05	157	.25	.25	.01	374.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.10	158	.25	.25	.01	381.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.15	159	.25	.25	.00	392.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.20	160	.25	.25	.00	406.
1.01	1.25	17	.01	0.00	.01	0.	1.01	13.25	161	.25	.25	.00	419.
1.01	1.30	18	.01	0.00	.01	0.	1.01	13.30	162	.25	.25	.00	431.
1.01	1.35	19	.01	0.00	.01	0.	1.01	13.35	163	.25	.25	.00	440.
1.01	1.40	20	.01	0.00	.01	0.	1.01	13.40	164	.25	.25	.00	447.
1.01	1.45	21	.01	0.00	.01	0.	1.01	13.45	165	.25	.25	.00	451.
1.01	1.50	22	.01	.00	.01	0.	1.01	13.50	166	.25	.25	.00	455.
1.01	1.55	23	.01	.00	.01	0.	1.01	13.55	167	.25	.25	.00	457.
1.01	2.00	24	.01	.00	.01	0.	1.01	14.00	168	.25	.25	.00	459.
1.01	2.05	25	.01	.00	.01	0.	1.01	14.05	169	.32	.31	.00	462.
1.01	2.10	26	.01	.00	.01	0.	1.01	14.10	170	.32	.31	.00	470.
1.01	2.15	27	.01	.00	.01	0.	1.01	14.15	171	.32	.31	.00	484.
1.01	2.20	28	.01	.00	.01	1.	1.01	14.20	172	.32	.31	.00	503.
1.01	2.25	29	.01	.00	.01	1.	1.01	14.25	173	.32	.31	.00	521.
1.01	2.30	30	.01	.00	.01	1.	1.01	14.30	174	.32	.31	.00	538.
1.01	2.35	31	.01	.00	.01	1.	1.01	14.35	175	.32	.31	.00	551.
1.01	2.40	32	.01	.00	.01	2.	1.01	14.40	176	.32	.31	.00	560.
1.01	2.45	33	.01	.00	.01	2.	1.01	14.45	177	.32	.31	.00	567.
1.01	2.50	34	.01	.00	.01	2.	1.01	14.50	178	.32	.31	.00	571.
1.01	2.55	35	.01	.00	.01	3.	1.01	14.55	179	.32	.31	.00	575.
1.01	3.00	36	.01	.00	.01	3.	1.01	15.00	180	.32	.31	.00	577.
1.01	3.05	37	.01	.00	.01	3.	1.01	15.05	181	.19	.19	.00	575.
1.01	3.10	38	.01	.00	.01	4.	1.01	15.10	182	.38	.38	.00	569.
1.01	3.15	39	.01	.00	.01	4.	1.01	15.15	183	.38	.38	.00	564.
1.01	3.20	40	.01	.00	.01	4.	1.01	15.20	184	.58	.57	.00	577.
1.01	3.25	41	.01	.00	.01	5.	1.01	15.25	185	.67	.67	.00	618.
1.01	3.30	42	.01	.00	.01	5.	1.01	15.30	186	1.63	1.63	.01	725.
1.01	3.35	43	.01	.00	.01	5.	1.01	15.35	187	2.69	2.68	.01	959.
1.01	3.40	44	.01	.00	.01	6.	1.01	15.40	188	1.06	1.05	.00	1326.
1.01	3.45	45	.01	.00	.01	6.	1.01	15.45	189	.67	.67	.00	1733.
1.01	3.50	46	.01	.00	.01	6.	1.01	15.50	190	.58	.57	.00	1998.
1.01	3.55	47	.01	.00	.01	6.	1.01	15.55	191	.38	.38	.00	2049.
1.01	4.00	48	.01	.00	.01	7.	1.01	16.00	192	.38	.38	.00	1927.
1.01	4.05	49	.01	.00	.01	7.	1.01	16.05	193	.30	.29	.00	1692.
1.01	4.10	50	.01	.00	.01	7.	1.01	16.10	194	.30	.29	.00	1422.
1.01	4.15	51	.01	.00	.01	7.	1.01	16.15	195	.30	.29	.00	1202.
1.01	4.20	52	.01	.00	.01	8.	1.01	16.20	196	.30	.29	.00	1029.
1.01	4.25	53	.01	.00	.01	8.	1.01	16.25	197	.30	.29	.00	892.
1.01	4.30	54	.01	.00	.01	8.	1.01	16.30	198	.30	.29	.00	792.
1.01	4.35	55	.01	.01	.01	8.	1.01	16.35	199	.30	.29	.00	720.
1.01	4.40	56	.01	.01	.01	8.	1.01	16.40	200	.30	.29	.00	668.
1.01	4.45	57	.01	.01	.01	9.	1.01	16.45	201	.30	.29	.00	633.
1.01	4.50	58	.01	.01	.01	9.	1.01	16.50	202	.30	.29	.00	608.
1.01	4.55	59	.01	.01	.01	9.	1.01	16.55	203	.30	.29	.00	590.

PLATE D-36

1.01	5.00	60	.01	.01	.01	9.	1.01	17.00	204	.30	.29	.00	578.
1.01	5.05	61	.01	.01	.01	9.	1.01	17.05	205	.23	.23	.00	567.
1.01	5.10	62	.01	.01	.01	10.	1.01	17.10	206	.23	.23	.00	554.
1.01	5.15	63	.01	.01	.01	10.	1.01	17.15	207	.23	.23	.00	535.
1.01	5.20	64	.01	.01	.01	10.	1.01	17.20	208	.23	.23	.00	513.
1.01	5.25	65	.01	.01	.01	10.	1.01	17.25	209	.23	.23	.00	492.
1.01	5.30	66	.01	.01	.01	10.	1.01	17.30	210	.23	.23	.00	474.
1.01	5.35	67	.01	.01	.01	11.	1.01	17.35	211	.23	.23	.00	460.
1.01	5.40	68	.01	.01	.01	11.	1.01	17.40	212	.23	.23	.00	451.
1.01	5.45	69	.01	.01	.01	11.	1.01	17.45	213	.23	.23	.00	445.
1.01	5.50	70	.01	.01	.01	11.	1.01	17.50	214	.23	.23	.00	440.
1.01	5.55	71	.01	.01	.01	11.	1.01	17.55	215	.23	.23	.00	437.
1.01	6.00	72	.01	.01	.01	11.	1.01	18.00	216	.23	.23	.00	435.
1.01	6.05	73	.07	.04	.03	12.	1.01	18.05	217	.02	.02	.00	426.
1.01	6.10	74	.07	.04	.03	16.	1.01	18.10	218	.02	.02	.00	403.
1.01	6.15	75	.07	.04	.03	22.	1.01	18.15	219	.02	.02	.00	357.
1.01	6.20	76	.07	.04	.02	31.	1.01	18.20	220	.02	.02	.00	296.
1.01	6.25	77	.07	.04	.02	41.	1.01	18.25	221	.02	.02	.00	233.
1.01	6.30	78	.07	.04	.02	50.	1.01	18.30	222	.02	.02	.00	194.
1.01	6.35	79	.07	.04	.02	58.	1.01	18.35	223	.02	.02	.00	174.
1.01	6.40	80	.07	.05	.02	64.	1.01	18.40	224	.02	.02	.00	156.
1.01	6.45	81	.07	.05	.02	69.	1.01	18.45	225	.02	.02	.00	140.
1.01	6.50	82	.07	.05	.02	73.	1.01	18.50	226	.02	.02	.00	125.
1.01	6.55	83	.07	.05	.02	77.	1.01	18.55	227	.02	.02	.00	112.
1.01	7.00	84	.07	.05	.02	80.	1.01	19.00	228	.02	.02	.00	101.
1.01	7.05	85	.07	.05	.02	82.	1.01	19.05	229	.02	.02	.00	90.
1.01	7.10	86	.07	.05	.01	85.	1.01	19.10	230	.02	.02	.00	81.
1.01	7.15	87	.07	.05	.01	87.	1.01	19.15	231	.02	.02	.00	72.
1.01	7.20	88	.07	.05	.01	89.	1.01	19.20	232	.02	.02	.00	65.
1.01	7.25	89	.07	.05	.01	90.	1.01	19.25	233	.02	.02	.00	58.
1.01	7.30	90	.07	.05	.01	92.	1.01	19.30	234	.02	.02	.00	52.
1.01	7.35	91	.07	.05	.01	93.	1.01	19.35	235	.02	.02	.00	47.
1.01	7.40	92	.07	.05	.01	95.	1.01	19.40	236	.02	.02	.00	42.
1.01	7.45	93	.07	.05	.01	96.	1.01	19.45	237	.02	.02	.00	37.
1.01	7.50	94	.07	.05	.01	97.	1.01	19.50	238	.02	.02	.00	35.
1.01	7.55	95	.07	.06	.01	98.	1.01	19.55	239	.02	.02	.00	34.
1.01	8.00	96	.07	.06	.01	99.	1.01	20.00	240	.02	.02	.00	34.
1.01	8.05	97	.07	.06	.01	100.	1.01	20.05	241	.02	.02	.00	34.
1.01	8.10	98	.07	.06	.01	101.	1.01	20.10	242	.02	.02	.00	34.
1.01	8.15	99	.07	.06	.01	102.	1.01	20.15	243	.02	.02	.00	34.
1.01	8.20	100	.07	.06	.01	102.	1.01	20.20	244	.02	.02	.00	34.
1.01	8.25	101	.07	.06	.01	103.	1.01	20.25	245	.02	.02	.00	34.
1.01	8.30	102	.07	.06	.01	104.	1.01	20.30	246	.02	.02	.00	34.
1.01	8.35	103	.07	.06	.01	104.	1.01	20.35	247	.02	.02	.00	34.
1.01	8.40	104	.07	.06	.01	105.	1.01	20.40	248	.02	.02	.00	34.
1.01	8.45	105	.07	.06	.01	106.	1.01	20.45	249	.02	.02	.00	34.
1.01	8.50	106	.07	.06	.01	106.	1.01	20.50	250	.02	.02	.00	34.
1.01	8.55	107	.07	.06	.01	107.	1.01	20.55	251	.02	.02	.00	34.
1.01	9.00	108	.07	.06	.01	107.	1.01	21.00	252	.02	.02	.00	34.
1.01	9.05	109	.07	.06	.01	108.	1.01	21.05	253	.02	.02	.00	34.
1.01	9.10	110	.07	.06	.01	108.	1.01	21.10	254	.02	.02	.00	34.
1.01	9.15	111	.07	.06	.01	108.	1.01	21.15	255	.02	.02	.00	34.
1.01	9.20	112	.07	.06	.01	109.	1.01	21.20	256	.02	.02	.00	34.
1.01	9.25	113	.07	.06	.01	109.	1.01	21.25	257	.02	.02	.00	34.
1.01	9.30	114	.07	.06	.01	110.	1.01	21.30	258	.02	.02	.00	34.
1.01	9.35	115	.07	.06	.01	110.	1.01	21.35	259	.02	.02	.00	34.
1.01	9.40	116	.07	.06	.01	110.	1.01	21.40	260	.02	.02	.00	34.
1.01	9.45	117	.07	.06	.01	111.	1.01	21.45	261	.02	.02	.00	34.
1.01	9.50	118	.07	.06	.00	111.	1.01	21.50	262	.02	.02	.00	34.
1.01	9.55	119	.07	.06	.00	111.	1.01	21.55	263	.02	.02	.00	34.
1.01	10.00	120	.07	.06	.00	112.	1.01	22.00	264	.02	.02	.00	34.
1.01	10.05	121	.07	.06	.00	112.	1.01	22.05	265	.02	.02	.00	34.

PLATE D-37

1.01	10.10	122	.07	.06	.00	112.	1.01	22.10	266	.02	.02	.00	34.
1.01	10.15	123	.07	.06	.00	112.	1.01	22.15	267	.02	.02	.00	34.
1.01	10.20	124	.07	.06	.00	113.	1.01	22.20	268	.02	.02	.00	34.
1.01	10.25	125	.07	.06	.00	113.	1.01	22.25	269	.02	.02	.00	34.
1.01	10.30	126	.07	.06	.00	113.	1.01	22.30	270	.02	.02	.00	34.
1.01	10.35	127	.07	.06	.00	113.	1.01	22.35	271	.02	.02	.00	34.
1.01	10.40	128	.07	.06	.00	113.	1.01	22.40	272	.02	.02	.00	34.
1.01	10.45	129	.07	.06	.00	114.	1.01	22.45	273	.02	.02	.00	34.
1.01	10.50	130	.07	.06	.00	114.	1.01	22.50	274	.02	.02	.00	34.
1.01	10.55	131	.07	.06	.00	114.	1.01	22.55	275	.02	.02	.00	34.
1.01	11.00	132	.07	.06	.00	114.	1.01	23.00	276	.02	.02	.00	34.
1.01	11.05	133	.07	.06	.00	114.	1.01	23.05	277	.02	.02	.00	34.
1.01	11.10	134	.07	.06	.00	115.	1.01	23.10	278	.02	.02	.00	34.
1.01	11.15	135	.07	.06	.00	115.	1.01	23.15	279	.02	.02	.00	34.
1.01	11.20	136	.07	.06	.00	115.	1.01	23.20	280	.02	.02	.00	34.
1.01	11.25	137	.07	.06	.00	115.	1.01	23.25	281	.02	.02	.00	34.
1.01	11.30	138	.07	.06	.00	115.	1.01	23.30	282	.02	.02	.00	34.
1.01	11.35	139	.07	.06	.00	115.	1.01	23.35	283	.02	.02	.00	34.
1.01	11.40	140	.07	.06	.00	115.	1.01	23.40	284	.02	.02	.00	34.
1.01	11.45	141	.07	.06	.00	116.	1.01	23.45	285	.02	.02	.00	34.
1.01	11.50	142	.07	.06	.00	116.	1.01	23.50	286	.02	.02	.00	34.
1.01	11.55	143	.07	.06	.00	116.	1.01	23.55	287	.02	.02	.00	34.
1.01	12.00	144	.07	.06	.00	116.	1.02	0.00	288	.02	.02	.00	34.
									SUM	32.24	30.66	1.58	57270.
										(819.)(	779.)(	40.)(	1621.71)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2049.	636.	199.	199.	57280.
CMS	58.	18.	6.	6.	1622.
INCHES		24.67	30.84	30.84	30.84
MM		626.63	783.22	783.22	783.22
AC-FT		316.	394.	394.	394.
THOUS CU M		389.	487.	487.	487.

PLATE D-38

DVN

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 1

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	102.	32.	10.	10.	2864.
CMS	3.	1.	0.	0.	81.
INCHES		1.23	1.54	1.54	1.54
MM		31.33	39.16	39.16	39.16
AC-FT		16.	20.	20.	20.
THOUS CU M		19.	24.	24.	24.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	205.	64.	20.	20.	5728.
CMS	6.	2.	1.	1.	162.
INCHES		2.47	3.08	3.08	3.08
MM		62.66	78.32	78.32	78.32
AC-FT		32.	39.	39.	39.
THOUS CU M		39.	49.	49.	49.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	410.	127.	40.	40.	11456.
CMS	12.	4.	1.	1.	324.
INCHES		4.93	6.17	6.17	6.17
MM		125.33	156.64	156.64	156.64
AC-FT		63.	79.	79.	79.
THOUS CU M		78.	97.	97.	97.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 4

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	717.	223.	70.	70.	20048.
CMS	20.	6.	2.	2.	568.
INCHES		8.63	10.79	10.79	10.79
MM		219.32	274.13	274.13	274.13
AC-FT		110.	138.	138.	138.
THOUS CU M		136.	170.	170.	170.

HYDROGRAPH AT STA000001 FOR PLAN 1, RTIO 5

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1025.	318.	99.	99.	28640.
CMS	29.	9.	3.	3.	811.
INCHES		12.34	15.42	15.42	15.42
MM		313.32	391.61	391.61	391.61
AC-FT		158.	197.	197.	197.
THOUS CU M		195.	243.	243.	243.

PLATE D-39

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

RESERVOIR ROUTING OF RATIOS OF PMF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
C00002	1	0	0	2	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-628.	-1

STAGE	627.70	635.00	
FLOW	0.00	0.00	
CAPACITY=	0.	45.	133.
ELEVATION=	605.	624.	640.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
627.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
627.7	3.0	1.5	640.

CREST LENGTH	5.	10.	230.	350.	640.
AT OR BELOW ELEVATION	627.7	627.9	627.9	628.8	629.7

STATION 000002, PLAN 1, RATIO 1 (0.05 PMF)

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.	2.	2.	3.	3.
3.	4.	4.	4.	5.	5.	5.	5.	5.	5.
5.	5.	5.	6.	6.	6.	6.	6.	6.	6.
6.	6.	6.	6.	6.	6.	6.	7.	8.	9.
11.	12.	13.	15.	16.	16.	17.	18.	18.	19.
19.	20.	21.	21.	22.	22.	22.	22.	23.	23.
23.	24.	24.	25.	26.	27.	27.	28.	28.	28.
28.	28.	28.	28.	29.	31.	35.	44.	59.	76.
88.	94.	92.	85.	75.	66.	58.	51.	45.	41.
38.	35.	33.	32.	31.	30.	29.	28.	27.	26.

PLATE D-40

NAI1

STATION 000002, PLAN 1, RATIO 5 (0.50 PMF)

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	6.	11.	16.
22.	26.	30.	34.	36.	38.	40.	42.	43.	44.
45.	46.	47.	47.	48.	48.	49.	50.	50.	50.
51.	51.	52.	52.	52.	53.	53.	53.	53.	54.
54.	54.	54.	54.	55.	55.	55.	55.	55.	55.
56.	56.	56.	56.	56.	56.	56.	57.	57.	57.
57.	57.	57.	57.	57.	57.	57.	57.	58.	58.
58.	58.	58.	58.	58.	61.	67.	79.	97.	117.
135.	150.	162.	170.	176.	180.	184.	187.	191.	196.
203.	209.	215.	219.	223.	225.	227.	228.	230.	232.
236.	243.	252.	261.	269.	275.	280.	283.	285.	287.
288.	287.	284.	285.	295.	325.	399.	541.	741.	925.
1012.	995.	905.	783.	666.	570.	494.	434.	389.	356.
334.	317.	304.	296.	289.	283.	276.	266.	256.	246.
238.	231.	226.	223.	221.	219.	217.	211.	198.	176.
149.	124.	107.	94.	84.	75.	68.	61.	55.	50.
45.	41.	37.	33.	30.	27.	25.	22.	21.	20.
19.	18.	18.	18.	18.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.		

STORAGE

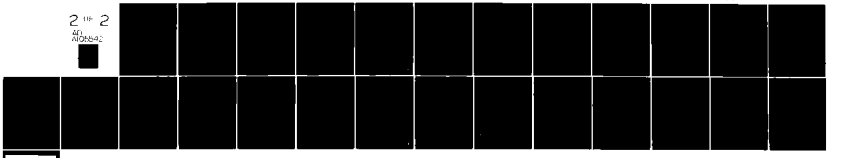
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	67.	67.	67.	67.	67.	67.
67.	67.	67.	67.	68.	68.	68.	68.	68.	68.
68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
68.	68.	68.	69.	69.	69.	69.	69.	69.	69.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
69.	69.	70.	70.	70.	70.	70.	70.	70.	70.
70.	70.	70.	70.	70.	70.	70.	70.	70.	70.
70.	70.	70.	70.	70.	70.	70.	70.	70.	70.
70.	70.	70.	70.	70.	71.	71.	72.	73.	73.
74.	74.	73.	73.	72.	72.	71.	71.	71.	71.
71.	71.	70.	70.	70.	70.	70.	70.	70.	70.
70.	70.	70.	70.	70.	70.	70.	70.	70.	70.
69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
68.	68.	68.	68.	68.	68.	68.	68.	68.	68.

PLATE D-41

AD-A105 542 HOSKINS-WESTERN-SONDEREGGER INC LINCOLN NE F/G 13/13
NATIONAL DAM SAFETY PROGRAM. WINDMILLER DAM NUMBER 1 (MO 10035)--ETC(U)
MAY 79 R S DECKER, G JAMISON, M MCMEEKIN

UNCLASSIFIED

NL



END
DATE FILMED
11 81
DTIC

68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
68.	68.	68.	68.	68.	68.	68.	68.		

STAGE

627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7
627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7
627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7
627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7
627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.7	627.8
627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8
627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8	627.8
627.8	627.9	627.9	627.9	627.9	627.9	627.9	627.9	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.1	628.2
628.2	628.2	628.2	628.3	628.3	628.3	628.3	628.3	628.3	628.3
628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3
628.3	628.4	628.4	628.4	628.4	628.4	628.4	628.4	628.4	628.4
628.4	628.4	628.4	628.4	628.4	628.4	628.5	628.6	628.8	628.9
629.0	629.0	628.9	628.8	628.8	628.7	628.6	628.6	628.5	628.5
628.5	628.4	628.4	628.4	628.4	628.4	628.4	628.4	628.4	628.4
628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3	628.3
628.2	628.2	628.2	628.1	628.1	628.1	628.1	628.1	628.1	628.1
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0	628.0
628.0	628.0	628.0	628.0	628.0	628.C	628.0	628.0		

PEAK OUTFLOW IS 1012. AT TIME 15.92 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1012.	318.	99.	99.	28409.
CMS	29.	9.	3.	3.	804.
INCHES		12.32	15.29	15.29	15.29
MM		312.86	388.46	388.46	388.46
AC-FT		158.	196.	196.	196.
THOUS CU M		194.	241.	241.	241.

PLATE D-42

DVF

STATION000002

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	200.	400.	600.	800.	1000.	1200.	0.	0.	0.	0.	0.	0.
.05	1I												
.10	2I												
.15	3I												
.20	4I												
.25	5I												
.30	6I												
.35	7I												
.40	8I												
.45	9I												
.50	10I												
.55	11I												
1.00	12I												
1.05	13I												
1.10	14I												
1.15	15I												
1.20	16I												
1.25	17I												
1.30	18I												
1.35	19I												
1.40	20I												
1.45	21I												
1.50	22I												
1.55	23I												
2.00	24I												
2.05	25I												
2.10	26I												
2.15	27I												
2.20	28I												
2.25	29I												
2.30	30I												
2.35	31I												
2.40	32I												
2.45	33I												
2.50	34I												
2.55	35I												
3.00	36I												
3.05	37I												
3.10	38I												
3.15	39I												
3.20	40I												
3.25	41I												
3.30	42I												
3.35	43I												
3.40	44I												
3.45	45I												
3.50	46I												
3.55	47I												
4.00	48I												
4.05	49I												
4.10	50I												
4.15	51I												
4.20	52I												
4.25	53I												
4.30	54I												
4.35	55I												
4.40	56I												

PLATE D-43

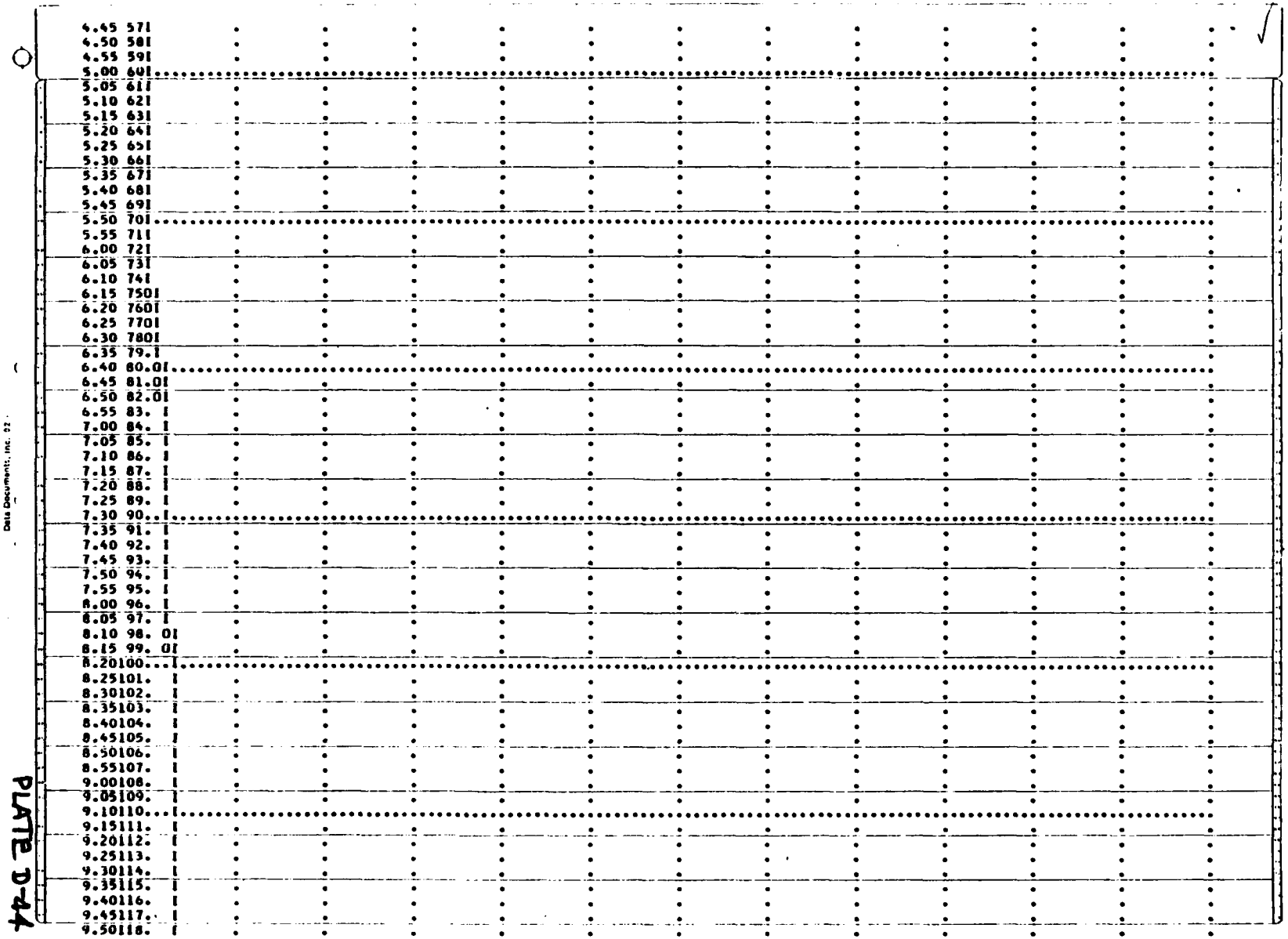


PLATE D-44

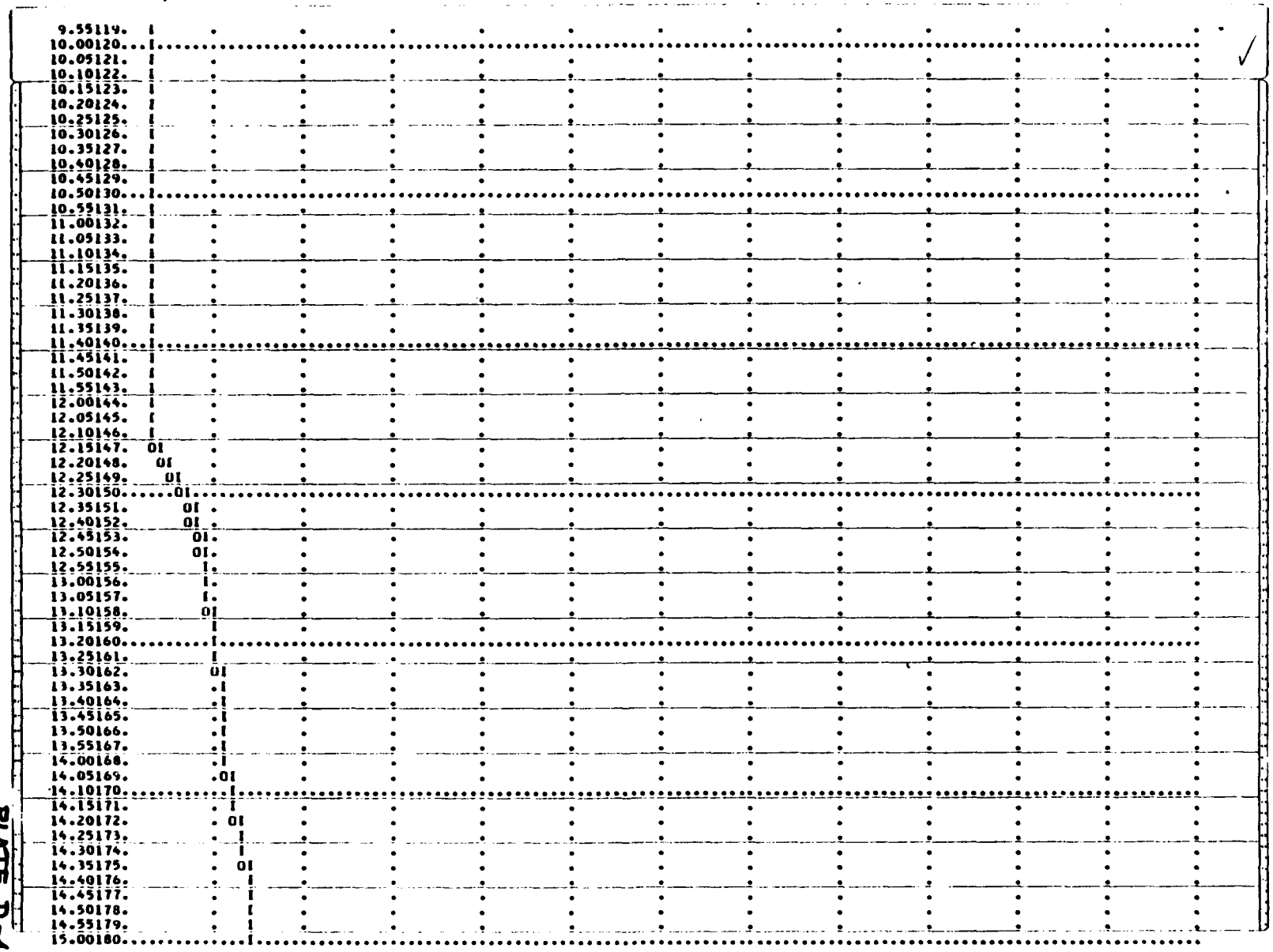


PLATE D-45

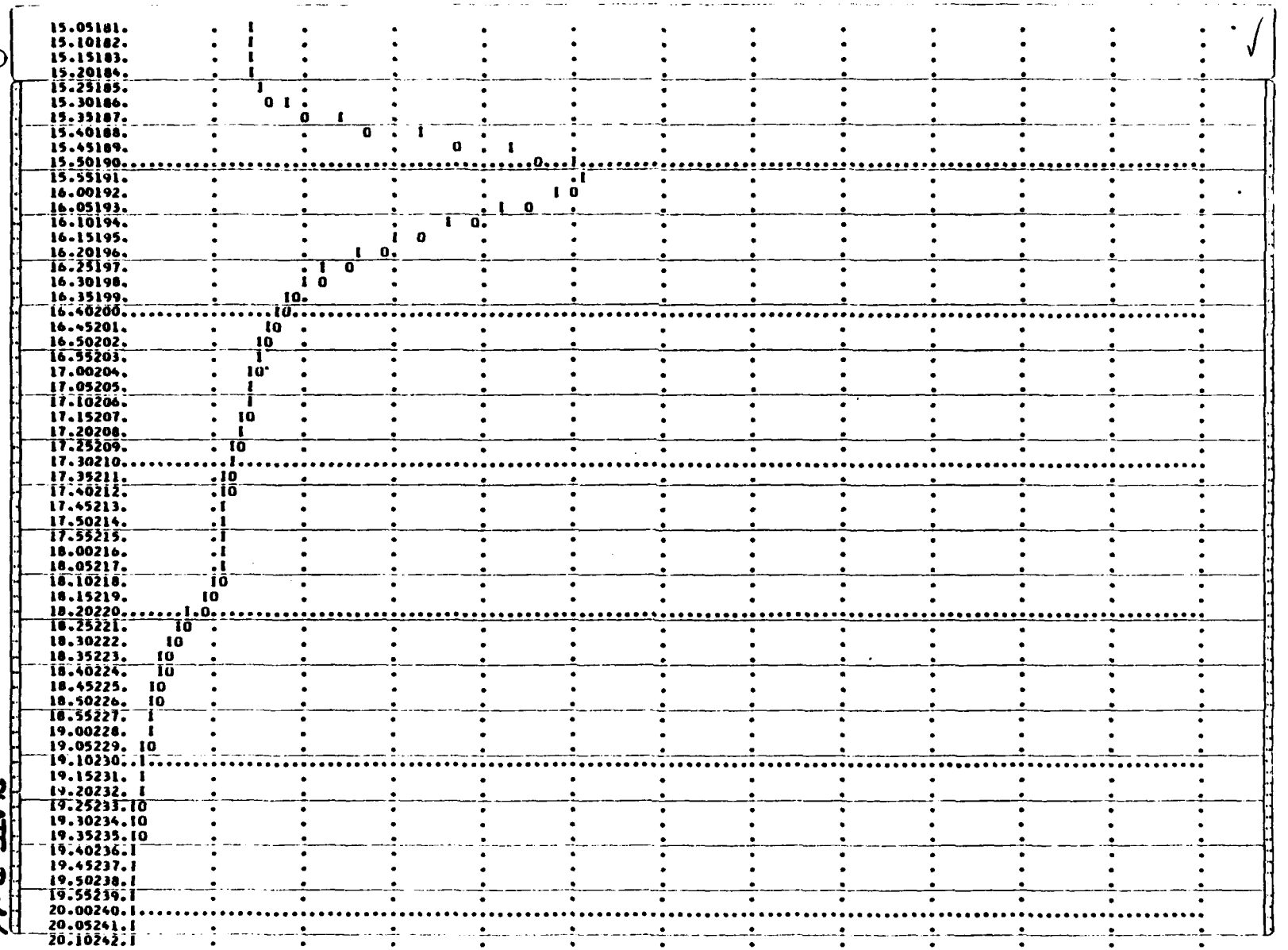


PLATE D-46

20.15243.1
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20.50250.1
20.55251.1
21.00252.1
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22.40272.1
22.45273.1
22.50274.1
22.55275.1
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23.30282.1
23.35283.1
23.40284.1
23.45285.1
23.50286.1
23.55287.1
0.00288.1

PLATE D-47

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .05	RATIO 2 .10	RATIO 3 .20	RATIO 4 .35	RATIO 5 .50
HYDROGRAPH AT	000001	.24	1	102.	205.	410.	717.	1025.
		(.62)		(2.90)(	5.80)(	11.60)(	20.31)(	29.01)(
ROUTED TO	000002	.24	1	94.	195.	396.	701.	1012.
		(.62)		(2.66)(	5.52)(	11.22)(	19.85)(	28.66)(

PLATE D-48

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	ELEVATION	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
	STORAGE	627.70	627.70	627.70
	OUTFLOW	67.	67.	67.
		0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.05	628.14	.44	69.	94.	22.17	16.00	0.00
.10	628.29	.59	70.	195.	22.25	16.00	0.00
.20	628.52	.82	71.	396.	22.25	16.00	0.00
.35	628.78	1.08	72.	701.	22.25	15.92	0.00
.50	628.99	1.29	74.	1012.	22.25	15.92	0.00

PLATE D-49

```
A1      MISSOURI DAM SAFETY INSPECTIONS
A2      WINDMILLER DAM MO 10835
A3      10-YR. FLOOD - SMALL DAM ONLY
B 000288000000000000005                                        00000003
B1000003
K 0C000000000001                  00000002          00000001
K1       10-YR. HYDROGRAPH
M 000000000000200000.24                           1.0
O 000288
0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.005
0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.005
0100.0050000.0050000.0050000.0050000.0050000.005C000.0050000.0050000.0050000.005
0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.005
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0100.0050000.0050000.0050000.00500C0.0050000.0050000.0050000.0050000.0050000.005
0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.005
0100.0050000.0050000.0110000.0110000.0110000.0110000.0110000.0110000.0110000.011
0100.0110000.0110000.0110000.0110000.0110000.0110000.0110000.0110000.0110000.011
0100.0110000.0110000.0110000.0110000.0110000.011C000.0110000.0110000.0110000.011
0100.0110000.0110000.0110000.0110000.0110000.0110000.0110000.0110000.0150000.015
0100.0150000.0150000.0150000.0150000.0150000.015000C.0150000.0150000.0150000.015
0100.0150000.0150000.0150000.0150000.0150000.0150000.0290000.0290000.0290000.029
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0100.0150000.0150000.0150000.0150000.0150000.0150000.0150000.0150000.0150000.015
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0100.0110000.0110000.0110000.0110000.0110000.0110000.0050000.0050000.0050000.005
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0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0C50000.0050000.005
0100.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.0050000.005
0100.0C500C0.0050000.0050000.0050000.0050000.0050000.0050000.005
T                                                          -1.    -75.
W2          0.35
X     0.     -.10      3.
K 00000100000002                  00000002          00000001
K1       RESERVOIR ROUTING OF 10-YR. FLOOD
Y                       00000001
Y1    1                                              -627.7      -1
Y4 627.7     635.
Y500000.0000000.
$S    0.      45.     133.
$E  605.    623.7     640.
$$ 627.7
$D 627.7      3.0      1.5     640.
$L00005.0000010.0000230.0000350.0000640.
$V 627.7    627.9    627.9    628.8    629.7
K 000099
A
A
A
A
A
```

PLATE D-50

```
******************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
 LAST MODIFICATION  26 FEB 79
******************************

RUN  DATE  79/08/23.
     TIME  15.01.41.

                     MISSOURI DAM SAFETY INSPECTIONS
                     WINDMILLER DAM NO 10035
                     10-YR. FLOOD - SMALL CAM ONLY

                              JOB SPECIFICATION
         NQ    NHR   NMIN   IDAY    IHR   IMIN  METRC   IPLT   IPRT  NSTAN
        288      0      5      0      0      0      0      0      3      0
                             JOPER    NWT  LROPT  TRACE
                                 3      0      0      0

     **********    **********    **********    **********    **********

                          SUB-AREA RUNOFF CCMPUTATION

               10-YR. HYDROGRAPH

                   ISTAQ   ICOMP   IECON   ITAPE   JPLT   JPRT  INAME  ISTAGE  IAUTO
                  000001       0       0       0      2      0      1       0      0

                              HYDROGRAPH DATA
         IHYDG   IUHG   TAREA    SNAP   TRSDA  TRSPC  RATIO  ISNOW  ISAME  LOCAL
             0      2     .24    0.00     .24   1.00  0.400      0      0      0

                                PRECIP DATA
                          NP   STORM     DAJ     DAK
                         288    0.00    0.00    0.00
                               PRECIP PATTERN
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .02    .02
     .02    .02    .02    .02    .02    .02    .02    .02    .02    .02
     .02    .02    .02    .02    .02    .02    .03    .03    .03    .03
     .03    .03    .06    .06    .06    .06    .06    .06    .08    .08
     .08    .15    .15    .37    .59    .26    .15    .08    .08    .08
     .06    .06    .06    .06    .06    .06    .03    .03    .03    .03
     .03    .03    .02    .02    .02    .02    .02    .02    .02    .02
     .02    .02    .02    .02    .02    .02    .02    .02    .02    .02
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
     .01    .01    .01    .01    .01    .01    .01    .01    .01    .01
```

.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01		

LOSS DATA

LRDPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-75.00	0.00	0.00

CURVE NO = -75.00 WETNESS = -1.00 EFFECT CN = 75.00

UNIT HYDROGRAPH DATA

TC= 0.00 LAG= .35

RECESSION DATA

STRTQ= 0.00 QRCSN= -.10 RTIOR= 3.00

UNIT HYDROGRAPH 23 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .35 VOL= 1.00

33.	104.	214.	284.	294.	260.	205.	136.	96.	69.
49.	34.	24.	17.	12.	9.	6.	4.	3.	2.
2.	1.	0.							

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.05	1	.01	0.00	.01	0.	1.01	12.05	145	.59	.37	.22	102.
1.01	.10	2	.01	0.00	.01	0.	1.01	12.10	146	.26	.17	.08	154.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.15	147	.15	.10	.05	216.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.20	148	.08	.06	.02	260.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.25	149	.08	.06	.02	274.
1.01	.30	6	.01	0.00	.01	0.	1.01	12.30	150	.08	.06	.02	261.
1.01	.35	7	.01	0.00	.01	0.	1.01	12.35	151	.06	.04	.02	230.
1.01	.40	8	.01	0.00	.01	0.	1.01	12.40	152	.06	.04	.02	194.
1.01	.45	9	.01	0.00	.01	0.	1.01	12.45	153	.06	.04	.02	165.
1.01	.50	10	.01	0.00	.01	0.	1.01	12.50	154	.06	.04	.02	143.
1.01	.55	11	.01	0.00	.01	0.	1.01	12.55	155	.06	.04	.02	126.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.00	156	.06	.04	.01	113.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.05	157	.03	.02	.01	104.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.10	158	.03	.02	.01	95.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.15	159	.03	.02	.01	86.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.20	160	.03	.02	.01	76.
1.01	1.25	17	.01	0.00	.01	0.	1.01	13.25	161	.03	.02	.01	67.
1.01	1.30	18	.01	0.00	.01	0.	1.01	13.30	162	.03	.02	.01	60.
1.01	1.35	19	.01	0.00	.01	0.	1.01	13.35	163	.02	.01	.00	54.
1.01	1.40	20	.01	0.00	.01	0.	1.01	13.40	164	.02	.01	.00	49.
1.01	1.45	21	.01	0.00	.01	0.	1.01	13.45	165	.02	.01	.00	44.
1.01	1.50	22	.01	0.00	.01	0.	1.01	13.50	166	.02	.01	.00	39.
1.01	1.55	23	.01	0.00	.01	0.	1.01	13.55	167	.02	.01	.00	34.
1.01	2.00	24	.01	0.00	.01	0.	1.01	14.00	168	.02	.01	.00	30.
1.01	2.05	25	.01	0.00	.01	0.	1.01	14.05	169	.02	.01	.00	28.
1.01	2.10	26	.01	0.00	.01	0.	1.01	14.10	170	.02	.01	.00	26.
1.01	2.15	27	.01	0.00	.01	0.	1.01	14.15	171	.02	.01	.00	25.
1.01	2.20	28	.01	0.00	.01	0.	1.01	14.20	172	.02	.01	.00	24.
1.01	2.25	29	.01	0.00	.01	0.	1.01	14.25	173	.02	.01	.00	23.
1.01	2.30	30	.01	0.00	.01	0.	1.01	14.30	174	.02	.01	.00	23.
1.01	2.35	31	.01	0.00	.01	0.	1.01	14.35	175	.02	.01	.00	22.
1.01	2.40	32	.01	0.00	.01	0.	1.01	14.40	176	.02	.01	.00	22.
1.01	2.45	33	.01	0.00	.01	0.	1.01	14.45	177	.02	.01	.00	22.
1.01	2.50	34	.01	0.00	.01	0.	1.01	14.50	178	.02	.01	.00	22.

PLATE D-52

1.01	2.55	35	.01	0.00	.01	0.	1.01	14.55	179	.02	.01	.00	22.
1.01	3.00	36	.01	0.00	.01	0.	1.01	15.00	180	.02	.01	.00	22.
1.01	3.05	37	.01	0.00	.01	0.	1.01	15.05	181	.01	.01	.00	22.
1.01	3.10	38	.01	0.00	.01	0.	1.01	15.10	182	.01	.01	.00	21.
1.01	3.15	39	.01	0.00	.01	0.	1.01	15.15	183	.01	.01	.00	21.
1.01	3.20	40	.01	0.00	.01	0.	1.01	15.20	184	.01	.01	.00	20.
1.01	3.25	41	.01	0.00	.01	0.	1.01	15.25	185	.01	.01	.00	19.
1.01	3.30	42	.01	0.00	.01	0.	1.01	15.30	186	.01	.01	.00	18.
1.01	3.35	43	.01	0.00	.01	0.	1.01	15.35	187	.01	.01	.00	17.
1.01	3.40	44	.01	0.00	.01	0.	1.01	15.40	188	.01	.01	.00	17.
1.01	3.45	45	.01	0.00	.01	0.	1.01	15.45	189	.01	.01	.00	17.
1.01	3.50	46	.01	0.00	.01	0.	1.01	15.50	190	.01	.01	.00	17.
1.01	3.55	47	.01	0.00	.01	0.	1.01	15.55	191	.01	.01	.00	16.
1.01	4.00	48	.01	0.00	.01	0.	1.01	16.00	192	.01	.01	.00	16.
1.01	4.05	49	.01	0.00	.01	0.	1.01	16.05	193	.01	.01	.00	16.
1.01	4.10	50	.01	0.00	.01	0.	1.01	16.10	194	.01	.01	.00	16.
1.01	4.15	51	.01	0.00	.01	0.	1.01	16.15	195	.01	.01	.00	16.
1.01	4.20	52	.01	0.00	.01	0.	1.01	16.20	196	.01	.01	.00	16.
1.01	4.25	53	.01	0.00	.01	0.	1.01	16.25	197	.01	.01	.00	16.
1.01	4.30	54	.01	0.00	.01	0.	1.01	16.30	198	.01	.01	.00	16.
1.01	4.35	55	.01	0.00	.01	0.	1.01	16.35	199	.01	.01	.00	16.
1.01	4.40	56	.01	0.00	.01	0.	1.01	16.40	200	.01	.01	.00	16.
1.01	4.45	57	.01	0.00	.01	0.	1.01	16.45	201	.01	.01	.00	16.
1.01	4.50	58	.01	0.00	.01	0.	1.01	16.50	202	.01	.01	.00	16.
1.01	4.55	59	.01	0.00	.01	0.	1.01	16.55	203	.01	.01	.00	16.
1.01	5.00	60	.01	0.00	.01	0.	1.01	17.00	204	.01	.01	.00	16.
1.01	5.05	61	.01	0.00	.01	0.	1.01	17.05	205	.01	.01	.00	16.
1.01	5.10	62	.01	0.00	.01	0.	1.01	17.10	206	.01	.01	.00	16.
1.01	5.15	63	.01	0.00	.01	0.	1.01	17.15	207	.01	.01	.00	16.
1.01	5.20	64	.01	0.00	.01	0.	1.01	17.20	208	.01	.01	.00	16.
1.01	5.25	65	.01	0.00	.01	0.	1.01	17.25	209	.01	.01	.00	16.
1.01	5.30	66	.01	0.00	.01	0.	1.01	17.30	210	.01	.01	.00	16.
1.01	5.35	67	.01	0.00	.01	0.	1.01	17.35	211	.01	.01	.00	16.
1.01	5.40	68	.01	0.00	.01	0.	1.01	17.40	212	.01	.01	.00	16.
1.01	5.45	69	.01	0.00	.01	0.	1.01	17.45	213	.01	.01	.00	16.
1.01	5.50	70	.01	0.00	.01	0.	1.01	17.50	214	.01	.01	.00	16.
1.01	5.55	71	.01	0.00	.01	0.	1.01	17.55	215	.01	.01	.00	16.
1.01	6.00	72	.01	0.00	.01	0.	1.01	18.00	216	.01	.01	.00	16.
1.01	6.05	73	.01	0.00	.01	0.	1.01	18.05	217	.01	.00	.00	16.
1.01	6.10	74	.01	0.00	.01	0.	1.01	18.10	218	.01	.00	.00	16.
1.01	6.15	75	.01	0.00	.01	0.	1.01	18.15	219	.01	.00	.00	15.
1.01	6.20	76	.01	0.00	.01	0.	1.01	18.20	220	.01	.00	.00	13.
1.01	6.25	77	.01	0.00	.01	0.	1.01	18.25	221	.01	.00	.00	12.
1.01	6.30	78	.01	0.00	.01	0.	1.01	18.30	222	.01	.00	.00	11.
1.01	6.35	79	.01	0.00	.01	0.	1.01	18.35	223	.01	.00	.00	10.
1.01	6.40	80	.01	0.00	.01	0.	1.01	18.40	224	.01	.00	.00	9.
1.01	6.45	81	.01	0.00	.01	0.	1.01	18.45	225	.01	.00	.00	9.
1.01	6.50	82	.01	0.00	.01	0.	1.01	18.50	226	.01	.00	.00	8.
1.01	6.55	83	.01	0.00	.01	0.	1.01	18.55	227	.01	.00	.00	8.
1.01	7.00	84	.01	0.00	.01	0.	1.01	19.00	228	.01	.00	.00	8.
1.01	7.05	85	.01	0.00	.01	0.	1.01	19.05	229	.01	.00	.00	8.
1.01	7.10	86	.01	0.00	.01	0.	1.01	19.10	230	.01	.00	.00	8.
1.01	7.15	87	.01	0.00	.01	0.	1.01	19.15	231	.01	.00	.00	8.
1.01	7.20	88	.01	0.00	.01	0.	1.01	19.20	232	.01	.00	.00	8.
1.01	7.25	89	.01	0.00	.01	0.	1.01	19.25	233	.01	.00	.00	8.
1.01	7.30	90	.01	0.00	.01	0.	1.01	19.30	234	.01	.00	.00	8.
1.01	7.35	91	.01	0.00	.01	0.	1.01	19.35	235	.01	.00	.00	8.
1.01	7.40	92	.01	0.00	.01	0.	1.01	19.40	236	.01	.00	.00	8.
1.01	7.45	93	.01	0.00	.01	0.	1.01	19.45	237	.01	.00	.00	8.
1.01	7.50	94	.01	0.00	.01	0.	1.01	19.50	238	.01	.00	.00	8.
1.01	7.55	95	.01	0.00	.01	0.	1.01	19.55	239	.01	.00	.00	8.
1.01	8.00	96	.01	0.00	.01	0.	1.01	20.00	240	.01	.00	.00	8.

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1.01	8.05	97	.01	0.00	.01	0.	1.01	20.05	241	.01	.00	.00	8.
1.01	8.10	98	.01	0.00	.01	0.	1.01	20.10	242	.01	.00	.00	8.
1.01	8.15	99	.01	0.00	.01	0.	1.01	20.15	243	.01	.00	.00	8.
1.01	8.20	100	.01	.00	.01	0.	1.01	20.20	244	.01	.00	.00	8.
1.01	8.25	101	.01	.00	.01	0.	1.01	20.25	245	.01	.00	.00	8.
1.01	8.30	102	.01	.00	.01	0.	1.01	20.30	246	.01	.00	.00	8.
1.01	8.35	103	.01	.00	.01	0.	1.01	20.35	247	.01	.00	.00	8.
1.01	8.40	104	.01	.00	.01	0.	1.01	20.40	248	.01	.00	.00	8.
1.01	8.45	105	.01	.00	.01	0.	1.01	20.45	249	.01	.00	.00	8.
1.01	8.50	106	.01	.00	.01	0.	1.01	20.50	250	.01	.00	.00	8.
1.01	8.55	107	.01	.00	.01	0.	1.01	20.55	251	.01	.00	.00	8.
1.01	9.00	108	.01	.00	.01	0.	1.01	21.00	252	.01	.00	.00	8.
1.01	9.05	109	.02	.00	.01	1.	1.01	21.05	253	.01	.00	.00	8.
1.01	9.10	110	.02	.00	.01	1.	1.01	21.10	254	.01	.00	.00	8.
1.01	9.15	111	.02	.00	.01	1.	1.01	21.15	255	.01	.00	.00	8.
1.01	9.20	112	.02	.00	.01	1.	1.01	21.20	256	.01	.00	.00	8.
1.01	9.25	113	.02	.00	.01	1.	1.01	21.25	257	.01	.00	.00	8.
1.01	9.30	114	.02	.00	.01	2.	1.01	21.30	258	.01	.00	.00	8.
1.01	9.35	115	.02	.00	.01	2.	1.01	21.35	259	.01	.00	.00	8.
1.01	9.40	116	.02	.00	.01	2.	1.01	21.40	260	.01	.00	.00	8.
1.01	9.45	117	.02	.00	.01	2.	1.01	21.45	261	.01	.00	.00	8.
1.01	9.50	118	.02	.00	.01	2.	1.01	21.50	262	.01	.00	.00	8.
1.01	9.55	119	.02	.00	.01	3.	1.01	21.55	263	.01	.00	.00	8.
1.01	10.00	120	.02	.00	.01	3.	1.01	22.00	264	.01	.00	.00	8.
1.01	10.05	121	.02	.00	.01	3.	1.01	22.05	265	.01	.00	.00	8.
1.01	10.10	122	.02	.00	.01	3.	1.01	22.10	266	.01	.00	.00	8.
1.01	10.15	123	.02	.00	.01	3.	1.01	22.15	267	.01	.00	.00	8.
1.01	10.20	124	.02	.00	.01	4.	1.01	22.20	268	.01	.00	.00	8.
1.01	10.25	125	.02	.00	.01	4.	1.01	22.25	269	.01	.00	.00	8.
1.01	10.30	126	.02	.00	.01	4.	1.01	22.30	270	.01	.00	.00	8.
1.01	10.35	127	.03	.01	.02	4.	1.01	22.35	271	.01	.00	.00	8.
1.01	10.40	128	.03	.01	.02	5.	1.01	22.40	272	.01	.00	.00	8.
1.01	10.45	129	.03	.01	.02	6.	1.01	22.45	273	.01	.00	.00	8.
1.01	10.50	130	.03	.01	.02	7.	1.01	22.50	274	.01	.00	.00	8.
1.01	10.55	131	.03	.01	.02	8.	1.01	22.55	275	.01	.00	.00	8.
1.01	11.00	132	.03	.01	.02	9.	1.01	23.00	276	.01	.00	.00	8.
1.01	11.05	133	.06	.02	.04	10.	1.01	23.05	277	.01	.00	.00	8.
1.01	11.10	134	.06	.02	.04	12.	1.01	23.10	278	.01	.00	.00	8.
1.01	11.15	135	.06	.02	.04	15.	1.01	23.15	279	.01	.00	.00	8.
1.01	11.20	136	.06	.02	.04	18.	1.01	23.20	280	.01	.00	.00	8.
1.01	11.25	137	.06	.02	.04	22.	1.01	23.25	281	.01	.00	.00	8.
1.01	11.30	138	.06	.02	.04	26.	1.01	23.30	282	.01	.00	.00	8.
1.01	11.35	139	.08	.03	.05	30.	1.01	23.35	283	.01	.00	.00	8.
1.01	11.40	140	.08	.03	.05	33.	1.01	23.40	284	.01	.00	.00	8.
1.01	11.45	141	.08	.03	.04	38.	1.01	23.45	285	.01	.00	.00	8.
1.01	11.50	142	.15	.07	.08	44.	1.01	23.50	286	.01	.00	.00	8.
1.01	11.55	143	.15	.07	.08	52.	1.01	23.55	287	.01	.00	.00	8.
1.01	12.00	144	.37	.20	.17	69.	1.02	0.00	288	.01	.00	.00	8.
									SUM	5.26	2.66	2.60	4927.
										(134.)(	68.)(	66.)(	139.52)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	274.	56.	17.	17.	4905.
CMS	8.	2.	0.	0.	139.
INCHES		2.18	2.64	2.64	2.64
MM		55.42	67.07	67.07	67.07
AC-FT		28.	34.	34.	34.
THOUS CU M		34.	42.	42.	42.

PLATE D-54

DVN

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HYDROGRAPH ROUTING

RESERVOIR ROUTING OF 10-YR. FLOOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
000002	1	0	0	2	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	0	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-628.	-1

STAGE	627.70	635.00							
FLOW	0.00	0.00							
CAPACITY=	0.	65.	133.						
ELEVATION=	605.	624.	640.						

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
627.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
627.7	3.0	1.5	640.

CREST LENGTH	5.	10.	230.	350.	640.
AT OR BELOW ELEVATION	627.7	627.9	627.9	628.6	629.7

END-OF-PERIOD HYDROGRAPH ORDINATES

MO.DA	HR.MN	PERIOD	HOURS	INFLOW	OUTFLOW	STORAGE	STAGE
1.01	.05	1	.08	0.	0.	67.	627.7
1.01	.10	2	.17	0.	0.	67.	627.7
1.01	.15	3	.25	0.	0.	67.	627.7
1.01	.20	4	.33	0.	0.	67.	627.7
1.01	.25	5	.42	0.	0.	67.	627.7
1.01	.30	6	.50	0.	0.	67.	627.7
1.01	.35	7	.58	0.	0.	67.	627.7
1.01	.40	8	.67	0.	0.	67.	627.7
1.01	.45	9	.75	0.	0.	67.	627.7
1.01	.50	10	.83	0.	0.	67.	627.7
1.01	.55	11	.92	0.	0.	67.	627.7
1.01	1.00	12	1.00	0.	0.	67.	627.7
1.01	1.05	13	1.08	0.	0.	67.	627.7
1.01	1.10	14	1.17	0.	0.	67.	627.7
1.01	1.15	15	1.25	0.	0.	67.	627.7
1.01	1.20	16	1.33	0.	0.	67.	627.7
1.01	1.25	17	1.42	0.	0.	67.	627.7
1.01	1.30	18	1.50	0.	0.	67.	627.7
1.01	1.35	19	1.58	0.	0.	67.	627.7
1.01	1.40	20	1.67	0.	0.	67.	627.7
1.01	1.45	21	1.75	0.	0.	67.	627.7

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1.01	1.50	22	1.83	0.	0.	67.	627.7
1.01	1.55	23	1.92	0.	0.	67.	627.7
1.01	2.00	24	2.00	0.	0.	67.	627.7
1.01	2.05	25	2.08	0.	0.	67.	627.7
1.01	2.10	26	2.17	0.	0.	67.	627.7
1.01	2.15	27	2.25	0.	0.	67.	627.7
1.01	2.20	28	2.33	0.	0.	67.	627.7
1.01	2.25	29	2.42	0.	0.	67.	627.7
1.01	2.30	30	2.50	0.	0.	67.	627.7
1.01	2.35	31	2.58	0.	0.	67.	627.7
1.01	2.40	32	2.67	0.	0.	67.	627.7
1.01	2.45	33	2.75	0.	0.	67.	627.7
1.01	2.50	34	2.83	0.	0.	67.	627.7
1.01	2.55	35	2.92	0.	0.	67.	627.7
1.01	3.00	36	3.00	0.	0.	67.	627.7
1.01	3.05	37	3.08	0.	0.	67.	627.7
1.01	3.10	38	3.17	0.	0.	67.	627.7
1.01	3.15	39	3.25	0.	0.	67.	627.7
1.01	3.20	40	3.33	0.	0.	67.	627.7
1.01	3.25	41	3.42	0.	0.	67.	627.7
1.01	3.30	42	3.50	0.	0.	67.	627.7
1.01	3.35	43	3.58	0.	0.	67.	627.7
1.01	3.40	44	3.67	0.	0.	67.	627.7
1.01	3.45	45	3.75	0.	0.	67.	627.7
1.01	3.50	46	3.83	0.	0.	67.	627.7
1.01	3.55	47	3.92	0.	0.	67.	627.7
1.01	4.00	48	4.00	0.	0.	67.	627.7
1.01	4.05	49	4.08	0.	0.	67.	627.7
1.01	4.10	50	4.17	0.	0.	67.	627.7
1.01	4.15	51	4.25	0.	0.	67.	627.7
1.01	4.20	52	4.33	0.	0.	67.	627.7
1.01	4.25	53	4.42	0.	0.	67.	627.7
1.01	4.30	54	4.50	0.	0.	67.	627.7
1.01	4.35	55	4.58	0.	0.	67.	627.7
1.01	4.40	56	4.67	0.	0.	67.	627.7
1.01	4.45	57	4.75	0.	0.	67.	627.7
1.01	4.50	58	4.83	0.	0.	67.	627.7
1.01	4.55	59	4.92	0.	0.	67.	627.7
1.01	5.00	60	5.00	0.	0.	67.	627.7
1.01	5.05	61	5.08	0.	0.	67.	627.7
1.01	5.10	62	5.17	0.	0.	67.	627.7
1.01	5.15	63	5.25	0.	0.	67.	627.7
1.01	5.20	64	5.33	0.	0.	67.	627.7
1.01	5.25	65	5.42	0.	0.	67.	627.7
1.01	5.30	66	5.50	0.	0.	67.	627.7
1.01	5.35	67	5.58	0.	0.	67.	627.7
1.01	5.40	68	5.67	0.	0.	67.	627.7
1.01	5.45	69	5.75	0.	0.	67.	627.7
1.01	5.50	70	5.83	0.	0.	67.	627.7
1.01	5.55	71	5.92	0.	0.	67.	627.7
1.01	6.00	72	6.00	0.	0.	67.	627.7
1.01	6.05	73	6.08	0.	0.	67.	627.7
1.01	6.10	74	6.17	0.	0.	67.	627.7
1.01	6.15	75	6.25	0.	0.	67.	627.7
1.01	6.20	76	6.33	0.	0.	67.	627.7
1.01	6.25	77	6.42	0.	0.	67.	627.7
1.01	6.30	78	6.50	0.	0.	67.	627.7
1.01	6.35	79	6.58	0.	0.	67.	627.7
1.01	6.40	80	6.67	0.	0.	67.	627.7
1.01	6.45	81	6.75	0.	0.	67.	627.7
1.01	6.50	82	6.83	0.	0.	67.	627.7
1.01	6.55	83	6.92	0.	0.	67.	627.7

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1.01	7.00	84	7.00	0.	0.	67.	627.7
1.01	7.05	85	7.08	0.	0.	67.	627.7
1.01	7.10	86	7.17	0.	0.	67.	627.7
1.01	7.15	87	7.25	0.	0.	67.	627.7
1.01	7.20	88	7.33	0.	0.	67.	627.7
1.01	7.25	89	7.42	0.	0.	67.	627.7
1.01	7.30	90	7.50	0.	0.	67.	627.7
1.01	7.35	91	7.58	0.	0.	67.	627.7
1.01	7.40	92	7.67	0.	0.	67.	627.7
1.01	7.45	93	7.75	0.	0.	67.	627.7
1.01	7.50	94	7.83	0.	0.	67.	627.7
1.01	7.55	95	7.92	0.	0.	67.	627.7
1.01	8.00	96	8.00	0.	0.	67.	627.7
1.01	8.05	97	8.08	0.	0.	67.	627.7
1.01	8.10	98	8.17	0.	0.	67.	627.7
1.01	8.15	99	8.25	0.	0.	67.	627.7
1.01	8.20	100	8.33	0.	0.	67.	627.7
1.01	8.25	101	8.42	0.	0.	67.	627.7
1.01	8.30	102	8.50	0.	0.	67.	627.7
1.01	8.35	103	8.58	0.	0.	67.	627.7
1.01	8.40	104	8.67	0.	0.	67.	627.7
1.01	8.45	105	8.75	0.	0.	67.	627.7
1.01	8.50	106	8.83	0.	0.	67.	627.7
1.01	8.55	107	8.92	0.	0.	67.	627.7
1.01	9.00	108	9.00	0.	0.	67.	627.7
1.01	9.05	109	9.08	1.	0.	67.	627.7
1.01	9.10	110	9.17	1.	0.	67.	627.7
1.01	9.15	111	9.25	1.	0.	67.	627.7
1.01	9.20	112	9.33	1.	0.	67.	627.7
1.01	9.25	113	9.42	1.	0.	67.	627.7
1.01	9.30	114	9.50	2.	0.	67.	627.7
1.01	9.35	115	9.58	2.	0.	67.	627.7
1.01	9.40	116	9.67	2.	0.	67.	627.7
1.01	9.45	117	9.75	2.	0.	67.	627.7
1.01	9.50	118	9.83	2.	0.	67.	627.7
1.01	9.55	119	9.92	3.	0.	67.	627.7
1.01	10.00	120	10.00	3.	0.	67.	627.7
1.01	10.05	121	10.08	3.	0.	67.	627.7
1.01	10.10	122	10.17	3.	0.	67.	627.7
1.01	10.15	123	10.25	3.	0.	67.	627.7
1.01	10.20	124	10.33	4.	0.	67.	627.7
1.01	10.25	125	10.42	4.	0.	67.	627.7
1.01	10.30	126	10.50	4.	0.	67.	627.7
1.01	10.35	127	10.58	4.	0.	67.	627.8
1.01	10.40	128	10.67	5.	0.	67.	627.8
1.01	10.45	129	10.75	6.	0.	67.	627.8
1.01	10.50	130	10.83	7.	0.	67.	627.8
1.01	10.55	131	10.92	8.	0.	67.	627.8
1.01	11.00	132	11.00	9.	0.	67.	627.8
1.01	11.05	133	11.08	10.	1.	67.	627.8
1.01	11.10	134	11.17	12.	1.	67.	627.8
1.01	11.15	135	11.25	15.	1.	67.	627.8
1.01	11.20	136	11.33	18.	1.	67.	627.8
1.01	11.25	137	11.42	22.	1.	67.	627.9
1.01	11.30	138	11.50	26.	2.	68.	627.9
1.01	11.35	139	11.58	30.	5.	68.	627.9
1.01	11.40	140	11.67	33.	12.	68.	628.0
1.01	11.45	141	11.75	38.	19.	68.	628.0
1.01	11.50	142	11.83	44.	26.	68.	628.0
1.01	11.55	143	11.92	52.	34.	68.	628.0
1.01	12.00	144	12.00	69.	45.	68.	628.0
1.01	12.05	145	12.08	102.	63.	69.	628.1

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1.01	12.10	146	12.17	154.	97.	69.	628.1	
1.01	12.15	147	12.25	216.	148.	69.	628.2	
1.01	12.20	148	12.33	260.	206.	70.	628.3	
1.01	12.25	149	12.42	274.	248.	70.	628.4	
1.01	12.30	150	12.50	261.	261.	70.	628.4	
1.01	12.35	151	12.58	230.	251.	70.	628.4	
1.01	12.40	152	12.67	194.	224.	70.	628.3	
1.01	12.45	153	12.75	165.	194.	70.	628.3	
1.01	12.50	154	12.83	143.	168.	70.	628.3	
1.01	12.55	155	12.92	126.	147.	69.	628.2	
1.01	13.00	156	13.00	113.	132.	69.	628.2	
1.01	13.05	157	13.08	104.	119.	69.	628.2	
1.01	13.10	158	13.17	95.	108.	69.	628.2	
1.01	13.15	159	13.25	86.	99.	69.	628.2	
1.01	13.20	160	13.33	76.	90.	69.	628.1	
1.01	13.25	161	13.42	67.	81.	69.	628.1	
1.01	13.30	162	13.50	60.	72.	69.	628.1	
1.01	13.35	163	13.58	54.	65.	69.	628.1	
1.01	13.40	164	13.67	49.	59.	69.	628.1	
1.01	13.45	165	13.75	44.	53.	69.	628.1	
1.01	13.50	166	13.83	39.	48.	69.	628.1	
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1.01	14.00	168	14.00	30.	39.	68.	628.0	
1.01	14.05	169	14.08	28.	35.	68.	628.0	
1.01	14.10	170	14.17	26.	32.	68.	628.0	
1.01	14.15	171	14.25	25.	29.	68.	628.0	
1.01	14.20	172	14.33	24.	28.	68.	628.0	
1.01	14.25	173	14.42	23.	26.	68.	628.0	
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1.01	14.45	177	14.75	22.	23.	68.	628.0	
1.01	14.50	178	14.83	22.	23.	68.	628.0	
1.01	14.55	179	14.92	22.	22.	68.	628.0	
1.01	15.00	180	15.00	22.	22.	68.	628.0	
1.01	15.05	181	15.08	22.	22.	68.	628.0	
1.01	15.10	182	15.17	21.	22.	68.	628.0	
1.01	15.15	183	15.25	21.	22.	68.	628.0	
1.01	15.20	184	15.33	20.	21.	68.	628.0	
1.01	15.25	185	15.42	19.	21.	68.	628.0	
1.01	15.30	186	15.50	18.	20.	68.	628.0	
1.01	15.35	187	15.58	17.	19.	68.	628.0	
1.01	15.40	188	15.67	17.	19.	68.	628.0	
1.01	15.45	189	15.75	17.	18.	68.	628.0	
1.01	15.50	190	15.83	17.	18.	68.	628.0	
1.01	15.55	191	15.92	16.	17.	68.	628.0	
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1.01	16.15	195	16.25	16.	17.	68.	628.0	
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1.01	16.25	197	16.42	16.	16.	68.	628.0	
1.01	16.30	198	16.50	16.	16.	68.	628.0	
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1.01	17.05	205	17.08	16.	16.	68.	628.0	
1.01	17.10	206	17.17	16.	16.	68.	628.0	
1.01	17.15	207	17.25	16.	16.	68.	628.0	

PLATE D-58

1.01	17.20	208	17.33	16.	16.	68.	628.0
1.01	17.25	209	17.42	16.	16.	68.	628.0
1.01	17.30	210	17.50	16.	16.	68.	628.0
1.01	17.35	211	17.58	16.	16.	68.	628.0
1.01	17.40	212	17.67	16.	16.	68.	628.0
1.01	17.45	213	17.75	16.	16.	68.	628.0
1.01	17.50	214	17.83	16.	16.	68.	628.0
1.01	17.55	215	17.92	16.	16.	68.	628.0
1.01	18.00	216	18.00	16.	16.	68.	628.0
1.01	18.05	217	18.08	16.	16.	68.	628.0
1.01	18.10	218	18.17	16.	16.	68.	628.0
1.01	18.15	219	18.25	15.	16.	68.	628.0
1.01	18.20	220	18.33	13.	15.	68.	628.0
1.01	18.25	221	18.42	12.	15.	68.	628.0
1.01	18.30	222	18.50	11.	14.	68.	628.0
1.01	18.35	223	18.58	10.	13.	68.	628.0
1.01	18.40	224	18.67	9.	12.	68.	628.0
1.01	18.45	225	18.75	9.	11.	68.	628.0
1.01	18.50	226	18.83	8.	10.	68.	627.9
1.01	18.55	227	18.92	8.	10.	68.	627.9
1.01	19.00	228	19.00	8.	9.	68.	627.9
1.01	19.05	229	19.08	8.	9.	68.	627.9
1.01	19.10	230	19.17	8.	9.	68.	627.9
1.01	19.15	231	19.25	8.	8.	68.	627.9
1.01	19.20	232	19.33	8.	8.	68.	627.9
1.01	19.25	233	19.42	8.	8.	68.	627.9
1.01	19.30	234	19.50	8.	8.	68.	627.9
1.01	19.35	235	19.58	8.	8.	68.	627.9
1.01	19.40	236	19.67	8.	8.	68.	627.9
1.01	19.45	237	19.75	8.	8.	68.	627.9
1.01	19.50	238	19.83	8.	8.	68.	627.9
1.01	19.55	239	19.92	8.	8.	68.	627.9
1.01	20.00	240	20.00	8.	8.	68.	627.9
1.01	20.05	241	20.08	8.	8.	68.	627.9
1.01	20.10	242	20.17	8.	8.	68.	627.9
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1.01	20.25	245	20.42	8.	8.	68.	627.9
1.01	20.30	246	20.50	8.	8.	68.	627.9
1.01	20.35	247	20.58	8.	8.	68.	627.9
1.01	20.40	248	20.67	8.	8.	68.	627.9
1.01	20.45	249	20.75	8.	8.	68.	627.9
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1.01	21.05	253	21.08	8.	8.	68.	627.9
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1.01	21.20	256	21.33	8.	8.	68.	627.9
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1.01	21.45	261	21.75	8.	8.	68.	627.9
1.01	21.50	262	21.83	8.	8.	68.	627.9
1.01	21.55	263	21.92	8.	8.	68.	627.9
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1.01	22.05	265	22.08	8.	8.	68.	627.9
1.01	22.10	266	22.17	8.	8.	68.	627.9
1.01	22.15	267	22.25	8.	8.	68.	627.9
1.01	22.20	268	22.33	8.	8.	68.	627.9
1.01	22.25	269	22.42	8.	8.	68.	627.9

PLATE D-59

1.01	22.30	270	22.50	0.	0.	68.	627.9
1.01	22.35	271	22.58	0.	0.	68.	627.9
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1.01	22.45	273	22.75	0.	0.	68.	627.9
1.01	22.50	274	22.83	0.	0.	68.	627.9
1.01	22.55	275	22.92	0.	0.	68.	627.9
1.01	23.00	276	23.00	0.	0.	68.	627.9
1.01	23.05	277	23.08	0.	0.	68.	627.9
1.01	23.10	278	23.17	0.	0.	68.	627.9
1.01	23.15	279	23.25	0.	0.	68.	627.9
1.01	23.20	280	23.33	0.	0.	68.	627.9
1.01	23.25	281	23.42	0.	0.	68.	627.9
1.01	23.30	282	23.50	0.	0.	68.	627.9
1.01	23.35	283	23.58	0.	0.	68.	627.9
1.01	23.40	284	23.67	0.	0.	68.	627.9
1.01	23.45	285	23.75	0.	0.	68.	627.9
1.01	23.50	286	23.83	0.	0.	68.	627.9
1.01	23.55	287	23.92	0.	0.	68.	627.9
1.02	0.00	288	24.00	0.	0.	68.	627.9

PEAK OUTFLOW IS 261. AT TIME 12.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	261.	96.	16.	16.	6719.
CMS	7.	2.	0.	0.	134.
INCHES		2.16	2.54	2.54	2.54
MM		54.87	64.53	64.53	64.53
1000 CU FT		28.	33.	33.	33.
THOUS CU M		34.	40.	40.	40.

PLATE D-60

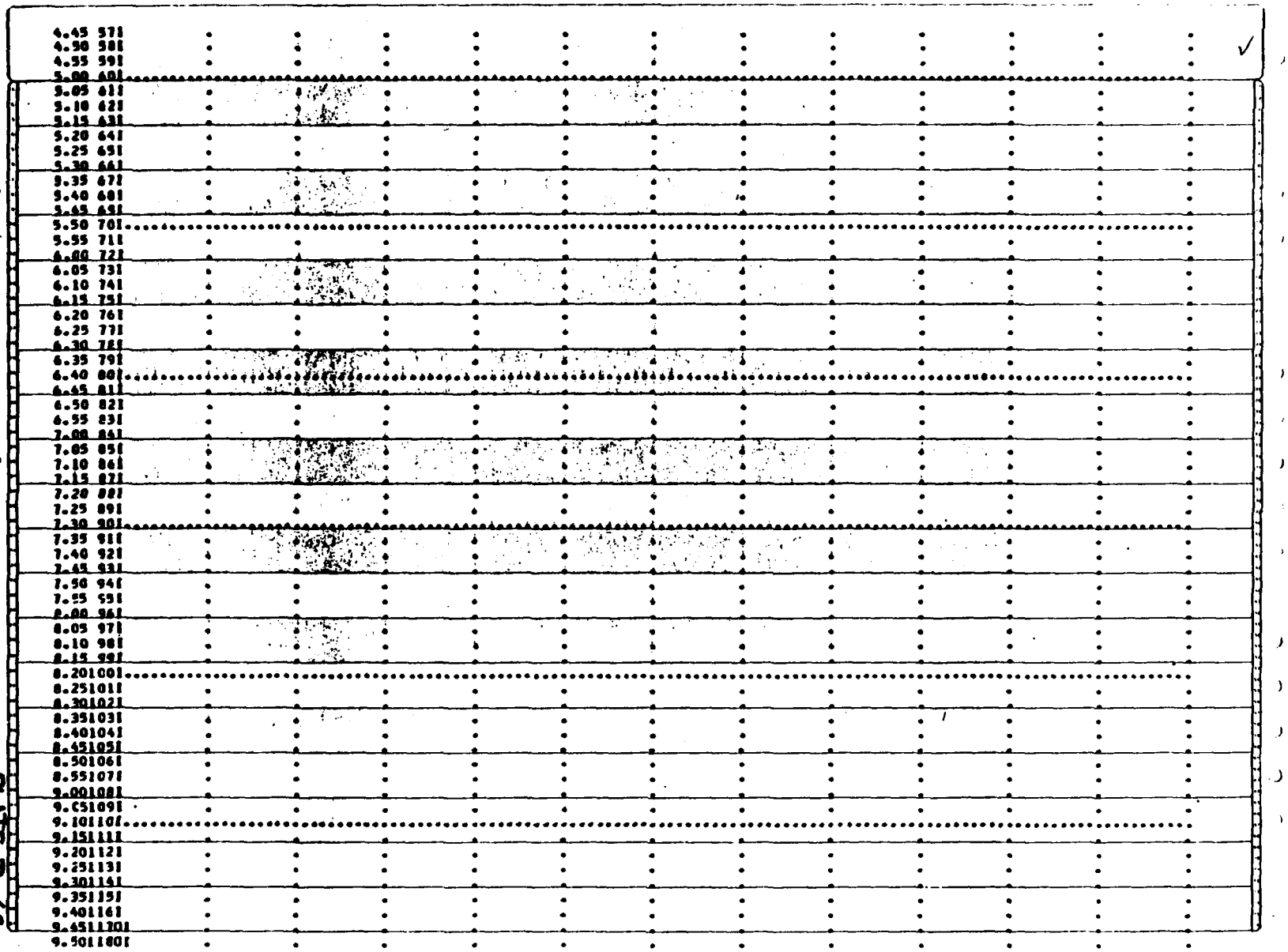
CVF

STATION000002

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	40.	80.	120.	160.	200.	240.	280.	0.	0.	0.	0.	0.
.05	I												
.10	I												
.15	I												
.20	I												
.25	I												
.30	I												
.35	I												
.40	I												
.45	I												
.50	I												
.55	I												
1.00	I												
1.05	I												
1.10	I												
1.15	I												
1.20	I												
1.25	I												
1.30	I												
1.35	I												
1.40	I												
1.45	I												
1.50	I												
1.55	I												
2.00	I												
2.05	I												
2.10	I												
2.15	I												
2.20	I												
2.25	I												
2.30	I												
2.35	I												
2.40	I												
2.45	I												
2.50	I												
2.55	I												
3.00	I												
3.05	I												
3.10	I												
3.15	I												
3.20	I												
3.25	I												
3.30	I												
3.35	I												
3.40	I												
3.45	I												
3.50	I												
3.55	I												
4.00	I												
4.05	I												
4.10	I												
4.15	I												
4.20	I												
4.25	I												
4.30	I												
4.35	I												
4.40	I												

PLATE D-21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4.55 591
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5.05 611
5.10 621
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5.35 671
5.40 681
5.45 691
5.50 701
5.55 711
6.00 721
6.05 731
6.10 741
6.15 751
6.20 761
6.25 771
6.30 781
6.35 791
6.40 801
6.45 811
6.50 821
6.55 831
7.00 841
7.05 851
7.10 861
7.15 871
7.20 881
7.25 891
7.30 901
7.35 911
7.40 921
7.45 931
7.50 941
7.55 951
8.00 961
8.05 971
8.10 981
8.15 991
8.201001
8.251011
8.301021
8.351031
8.401041
8.451051
8.501061
8.551071
9.001081
9.051091
9.101101
9.151111
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9.401161
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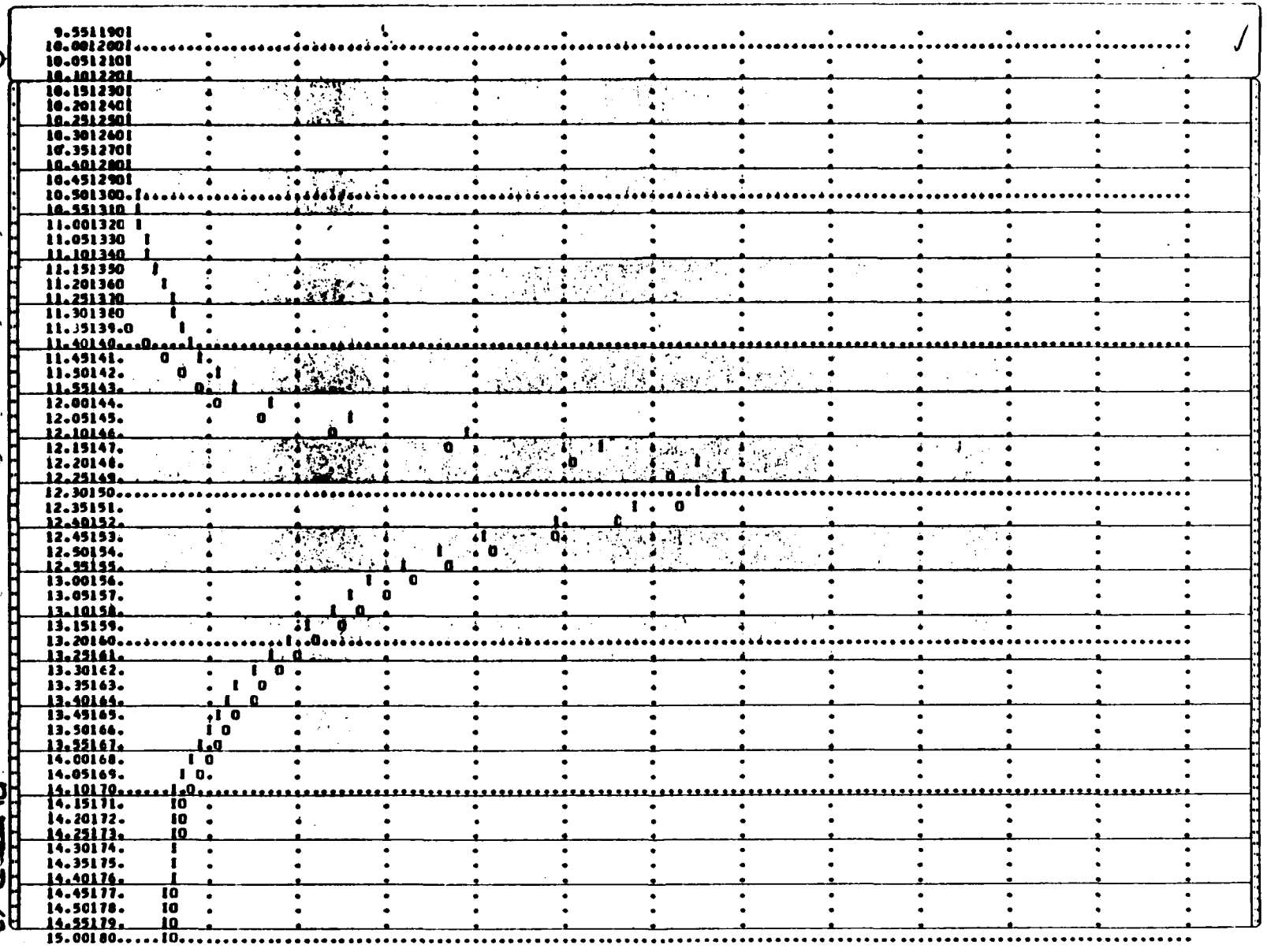
9.501181

PLATE D-62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10.50130
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11.05133
11.10134
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12.30150
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12.40152.
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PLATE D-63

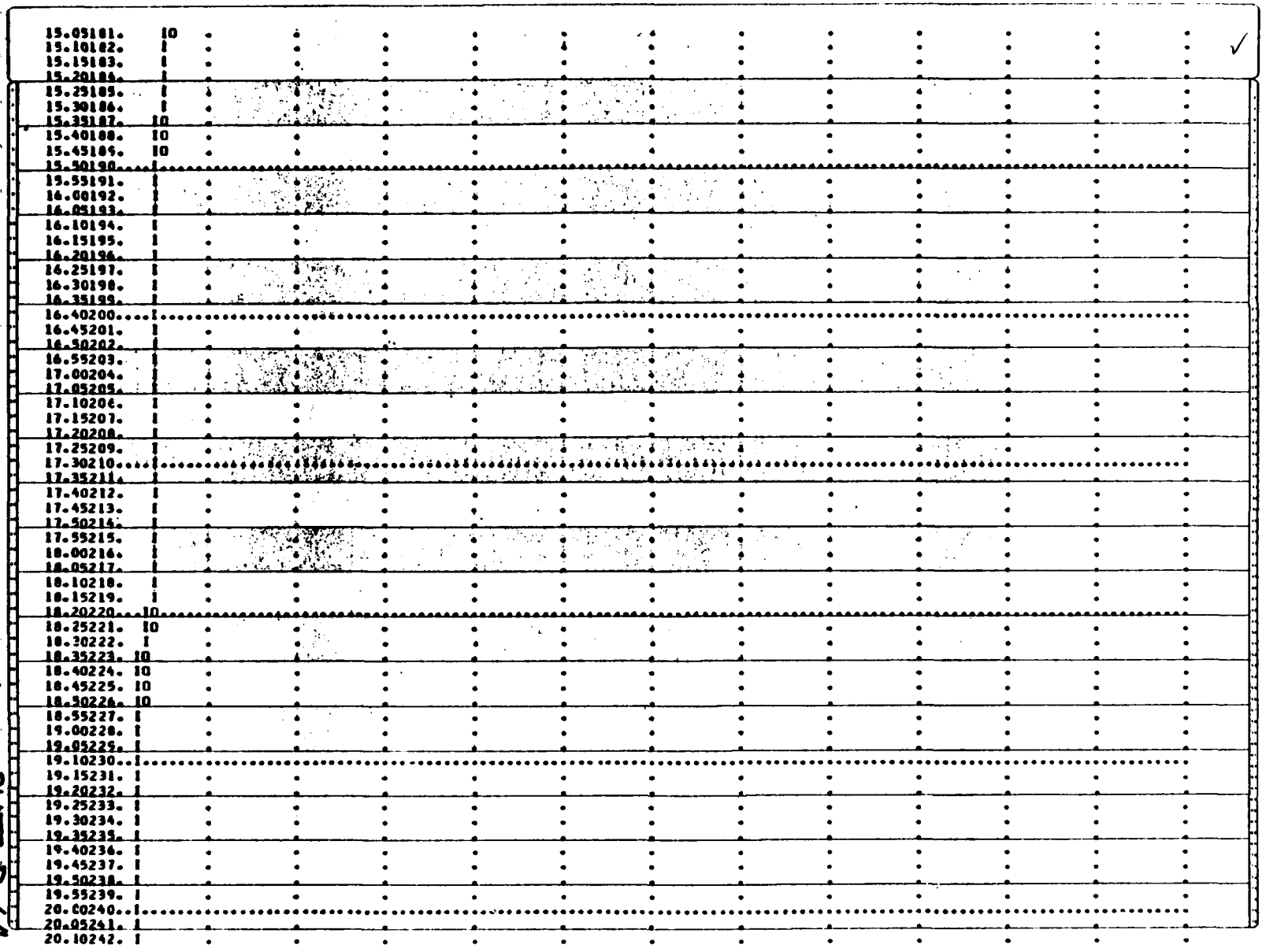
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PLATE D-64

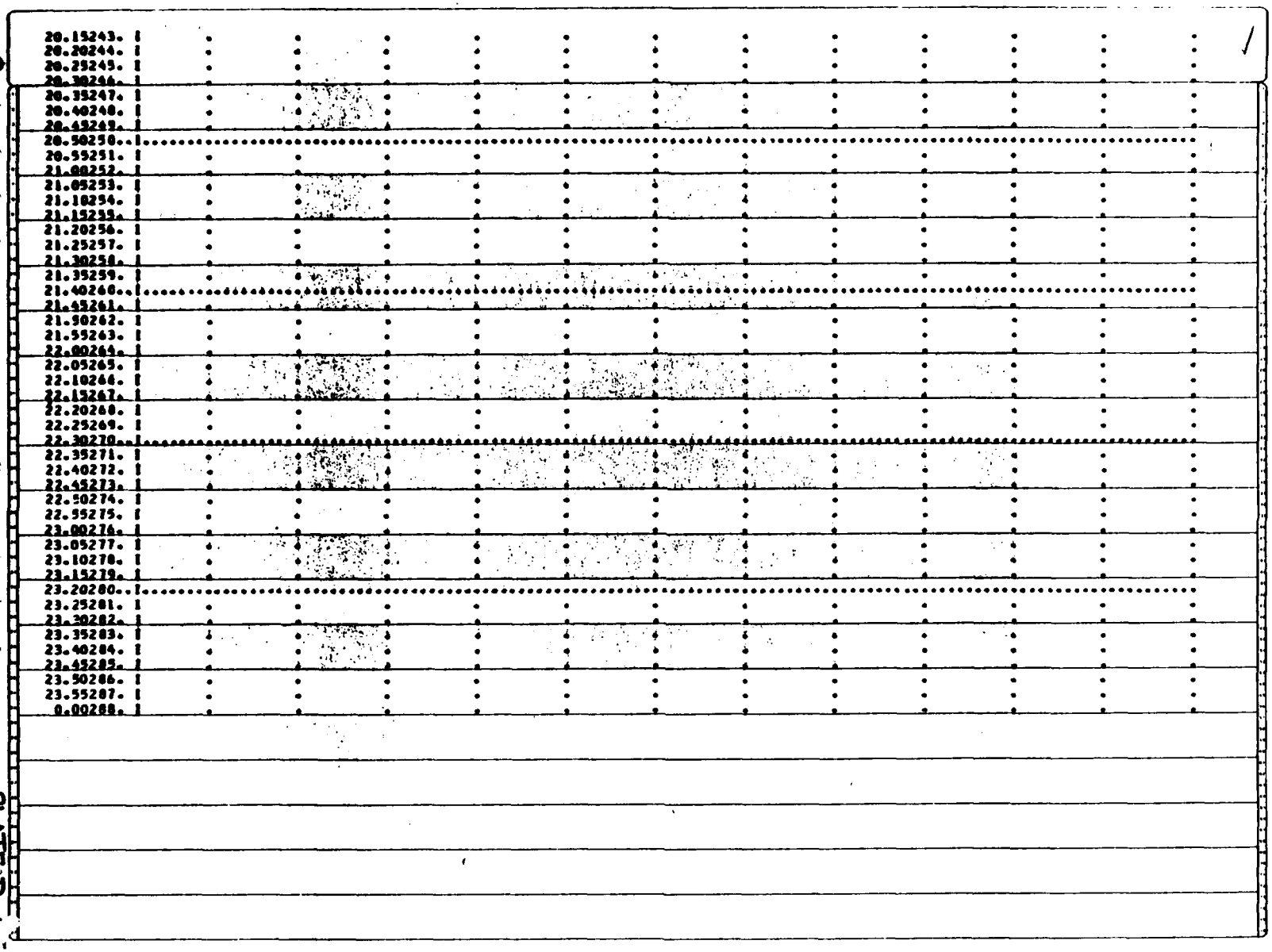
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PLATE P-6

RUNOFF SUMMARY, AVERAGE FLOW IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES(SQUARE KILOMETERS)

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	000001	274.	56.	17.	17.	.24
		(7.76)(	1.59)(	.48)(	.48)(	.62)
ROUTED TO	000002	261.	56.	16.	16.	.24
		(7.39)(	1.58)(	.46)(	.46)(	.62)

PLATE D-22

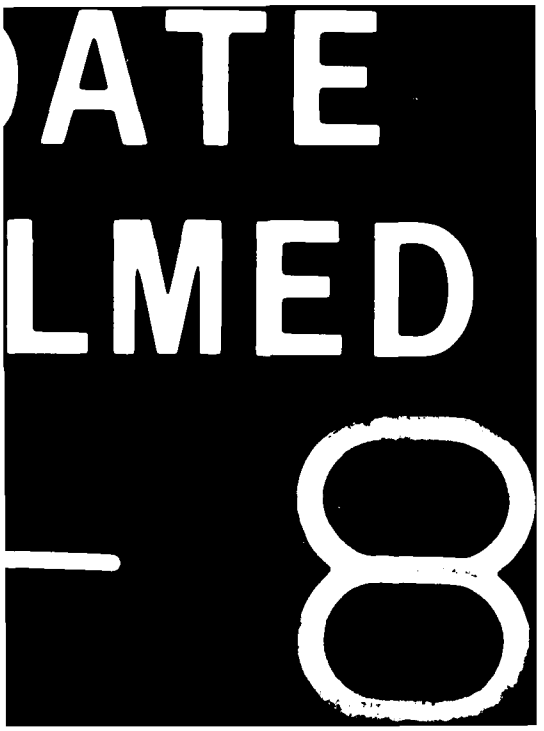
SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	627.70	627.70	627.70
STORAGE	67.	67.	67.
OUTFLOW	0.	0.	0.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.00	628.37	.67	70.	261.	15.75	12.50	0.00

PLATE D-67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LMED
8